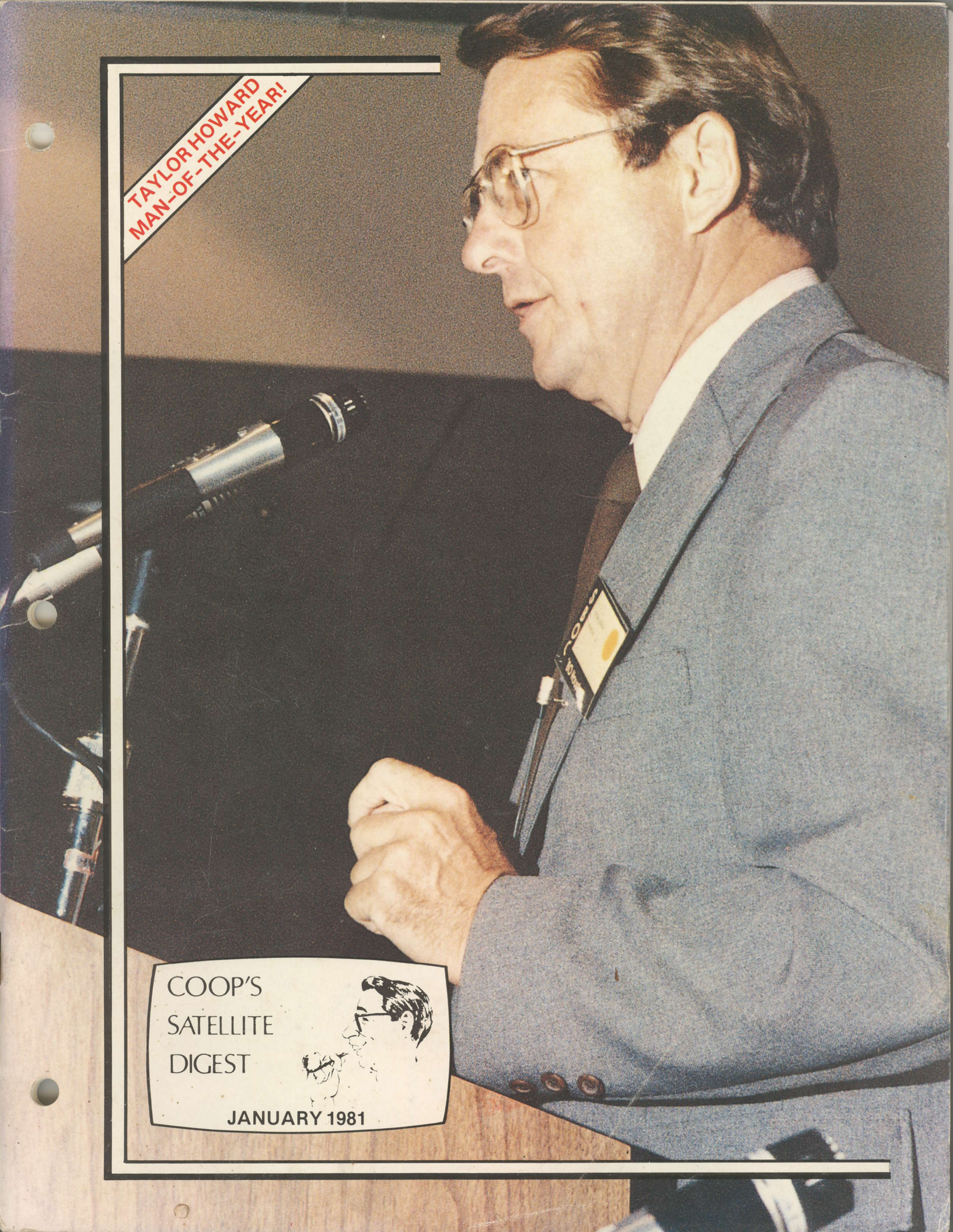

COOP'S SATELLITE DIGEST

JANUARY 1981

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COOP'S SATELLITE DIGEST T1-1/81

COOP'S COMMENT ON TECHNOLOGY

REBOUNDING FROM HOUSTON

Our first SBOC is now history. It will be well remembered for many positive reasons. First there was the crowd; we ended up with 750 chairs set out in the lecture hall and several times all were filled while the usual crowd hung out in the exhibit hall even though the lights were turned off and they had been repeatedly asked to vacate the premises. That made the group 50% bigger than any previous. Then there was the exhibit hall; 34 exhibit spaces in all filled with anxious, curious people.

Virtually every supplier on hand 'sold out' several months production. I tried to get a handle on the dollar size of orders at the Conference and finally gave up while perhaps 50% completed with the survey and well over the ten million dollar mark. I won't even guess an accurate number but have reason to believe at least one supplier wrote over a million dollars in orders in a single booth. That's not bad for a tiny industry nobody in the big time circles pays any attention to!

Not everything at Houston was positive. The hotel sold out far too far in advance and several hundred people had to bunk elsewhere. The Adams-Mark Hotel is on the 'wrong' side of the city from both airports and those who didn't trust the bus and limo service found themselves $20-$30 poorer when they arrived in a cab (even though we had given specific instruction on taking an airport-bus service). One exhibitor had a 100 degree LNA lifted from his display table; a chap who brought a tape machine lost it out of the 'communal taping room'.

While some people at Houston had been to previous SPTS/SBOC affairs, we estimated 80% were at their first 'show'. We created this number after a showing of hands during an early session. The exhibitors we talked with seemed to agree that this bunch was a 'new breed' of satellite enthusiasts; people drawn to Houston because they smelled money.

The smell of money (big money perhaps) has begun to draw into the field some questionable products and potentially fly-by-night retailers. During our traditional 8 AM 'Today at SBOC' closed circuit TV show we attempted to deal with this problem on the last two days of the Conference. A $695 receiver from a chap who had previously announced a $1500 receiver + LNA (and then failed to deliver) had several of the 'old-timers' concerned that black marks credited to one 'supplier' might rub off on others who were trying to do a good job at a fair price. I tried to arrange a first hand inspection of this particular receiver but the supplier didn't want to show me it working when I had time to look. In fairness, others who did see it work later told me it showed pictures. Robert Coleman's barefoot TD-2 mixer showed pictures back in 1979 or so too but they were hardly saleable. I am still concerned about the quality of pictures, for consumers, from the $995 receivers and as a matter of personal concern would caution retailers from getting too interested in anything below that price level until they had personally inspected the product, its performance, **and** the manufacturing facility.

Speaking of Bob Coleman, he had a pair of receivers at Houston which anyone would be proud to own or sell. Robert decided to forget about the PLL trade offs and went directly to a discriminator with excellent results. His color images on an A-B test against new Microdyne units were every bit as sharp. His single source distributor, H & R, will be hard pressed to keep up with the orders after people see how good it works for about half the price of a Microdyne.

So what comes next? Too close for our January deadline to publish it officially, we are hopeful of overcoming the logistics problems to hold the spring SPTS in the Washington, D.C. area. S.P.A.C.E.'s Rick Brown has me convinced we need a strong showing in the nation's capitol to be able to show off our technology to influential legislators and regulators. The narrow escape from HR 7747 this past fall left some of us both nervous and concerned what may happen the next time around. So if you are a calendar circler you might be blocking off the last week in March and the first week in April hopeful (as we are) that someplace in that region the next gathering of the clan will occur.

Houston had a pervasive upbeat mood. Aggressive new dealers were everyplace searching for equipment, sales information, and solid signs that this was a field worthy of their investment and time. The equipment scene looks better each month with at least 3 manufacturers (KLM, ICM and Sat-Tec) now shipping receivers in the quantity area (100 to 400 per month). We believe between **these three** suppliers there are no fewer than 750 new receivers entering the market monthly. Over the next four months there will be ample opportunity for those who attended Houston to put what they think they learned into practice. When we all show up at the spring SPTS we'll again visit the progress in the commercial area and see just how well the latest batch of entrants have fared.

OUR COVER

Taylor Howard - the private terminal industry's **Man Of The Year**. CSD found little competition for this first year's industry recognition award; Tay is the obvious choice. For those who are new to the field a run down of the Professor's contributions to this industry appear elsewhere in this issue.

CSD TECHNOLOGY

COOP'S SATELLITE DIGEST (Technology Section) is published monthly by Robert B. and Susan T. Cooper doing business as Satellite Television Technology (STT). Editorial offices located at West Indies Video, Grace Bay, Providenciales, Turks & Caicos, BWI. Communication with editorial office is through Business Office at P. O. Box G, Arcadia, OK 73007 (405-396-2574); Rick Schneringer, Manager. Photography, Kevin Paul Cooper; editorial assistance Tasha Anne Cooper. STT produces various manuals, videotapes, guides and texts plus conducts the twice annual SPTS and once-annual SBOC events. STT is not affiliated with any manufacturer or distributor of satellite communications equipment. **CSD** subscription $50 per year US / Canada / Mexico; $75 elsewhere.

SBOC '80 HOUSTON REPORT

BIGGER! BETTER?

SBOC '80 is over. A crowd estimated at more than 800 jammed into the recently opened Houston Adams-Mark Hotel to participate in three days of lectures, seminar demonstrations, equipment displays and approximately 30 hours of in-house closed circuit TV devoted to the development of this young industry.

SBOC was the largest event held to date. Patterned after the daily sequence developed for San Jose (a full day of lectures and seminars on day-one, a full day of exhibits broken up by a SPACE meeting on day-two, and a mixed day of lectures and exhibits on day-three) SBOC attracted a largely new breed of business entrepreneurs intent upon embracing this exciting new technology for their own. They were swimming pool dealers/installers from West Texas and Big Screen TV distributors from Detroit. They were farm implement dealers from North Dakota and businessmen from Bermuda. They came from as far as Sweden and during the special 'local day' they came from Houston proper.

They came and shared their experiences to date (if they were already in the business) and if they were first-timers they listened a lot and asked many questions. Every exhibitor we asked said they wrote more business orders the first day than they did in San Jose in three days. And San Jose had been the best show to date for the commercial suppliers.

One installer from Mexico shared his experiences with commercial installations in that country. With a 15 foot antenna several hundred miles south of the Texas border he had provided an internationally known hotel chain with **live** US TV. It was a high quality, commercial installation. Then the authorities came and shut it down insisting that he have **two** licenses before re-opening the installation. License one, they said, must come from the Mexican version of the FCC. License two, they said, must come from the program suppliers themselves. He had engaged a well known attorney in Mexico to plead his case and the requirement for license one was shortly eliminated. Armed with several letters of permission (CBN, Trinity, PTL et al) for use of the programming signals available on satellite he was confident that license two's requirement would shortly disappear. "I have the resources and experience to put in dozens of these terminals in the next

A SMILE ON HIS FACE only a successful satellite acquisition could create this SBOC'er mixes work with answering inquisitive attendee questions in Houston.

12 months in Mexico'' he confided. He also obviously had the resolve to see that the early hurdles were overcome. ''I am a pioneer'' he stated proudly, matter-of-factly. That he is.

Other up and running installers reported on the problems they were having getting the legal right to use (as in re-selling) premium service channels to motels, apartments and condominiums. ''HBO and SHOWTIME will simply not deal with you if you are operating anyplace close to an area where cable service is now available or where it is likely to be available in the future'' numerous installers reported. ''Even The Movie Channel has been reluctant to deal with us in some markets'' reported another installer. Rumors of anti-trust lawsuits and non-competitive practices swept through the crowded seminar room. ''Can they **legally** withhold the product from our systems if we are ready, willing and able to deal with them on their stated terms?'' wondered another attendee.

Rick Brown, General Counsel for SPACE summed it up privately. **''There is a very large, winnable, lawsuit here just waiting for filing. The premium service channels on satellite are acting without good sense or legal counsel when they** refuse **to make their services available to qualified applicants''**. Why has SPACE not started such a lawsuit?

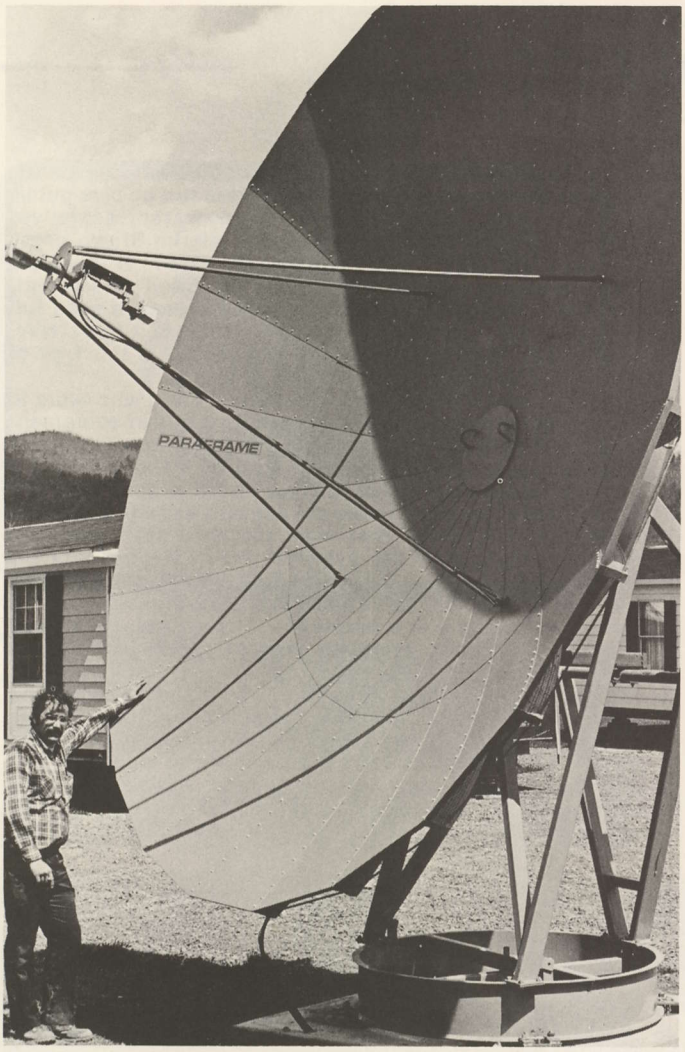
''Anti-trust suits are among the most expensive suits to prosecute. The discovery process, obtaining depositions, tracing intra-corporate memos and policy maker decisions and actions is long, hard and tedious. Today this industry does not have anyplace close to the several hundred thousand dollars it would take to get such a suit off the ground''. Are there other ways to get the attention of the premium service suppliers?''

''Perhaps there is'' Brown smiles mindful that any legislation introduced in the next session of Congress will involve public hearings and the opportunity for testimony by representatives of the private terminal industry. **In the interim Brown urges any suppliers who have received any type of negative communications** (including 'warnings not to sell' equipment) **from HBO, SHOWTIME or The Movie Channel to send full details** to his attention at SPACE (1521 O Street NW, Washington, D.C. 20005) where a growing file of this type of nonsense is building.

Those who are veterans in the industry and who came to Houston expecting magnificent break throughs in equipment had to look hard for the objects of their affection. True, new (not previously seen) equipment was on hand but unlike previous events when one or two new pieces of gear 'stole the show' at SBOC Houston it was the almost awesome display of equipment in quantity that stole the show. At least one distributor (Satellite Video Systems; Bobby Kaylor) brought extensive inventories of equipment to the show for off-the-floor sale. Kaylor now handles virtually every line of receiver in the marketplace along with a couple of LNA products. He arrived in Houston with **50 complete terminal packages** (i.e. all electronics) and in his case instant delivery was just that!

Exciting equipment innovation was found in surprising areas. Home Satellite Television Systems brought to Houston possibly the most advanced technology in antenna positioning systems seen to date. Married to a ten foot dish antenna HSTS sells in the mid-west the complete system borrows micro-computer technology to provide effortless armchair control of dish movement from satellite to satellite. If you can

WE COUNTED 22 operating antennas at peak of SBOC [including Luly Umbrella antenna in tent to upper left]; largest was 20 footer [Hero Communications division of A-B] while there were many in ten foot class plus Vidiark 8 foot Spherical. They all worked.



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THE CARRIBEAN CONQUEROR!

NEW! The SIX METER Paraframe antenna! 45.4 dBi of real world gain so you'll equal 8 dB receiver threshold (using a 100°K LNA) with a squalid 27.1 dBw satellite EIRP. Real world performance equal to many 7 meter antennas costing over $12,000.
PARAFRAME ET/6.00 .....$6990.

PARAFRAME ET/4.85 meters of real world gain (43.5 dBi), not just 4.85 meters of size! With 8 dB CNR threshold and 100°K LNA, satellite EIRP minimum is just 29.0 dBw.....$5390.

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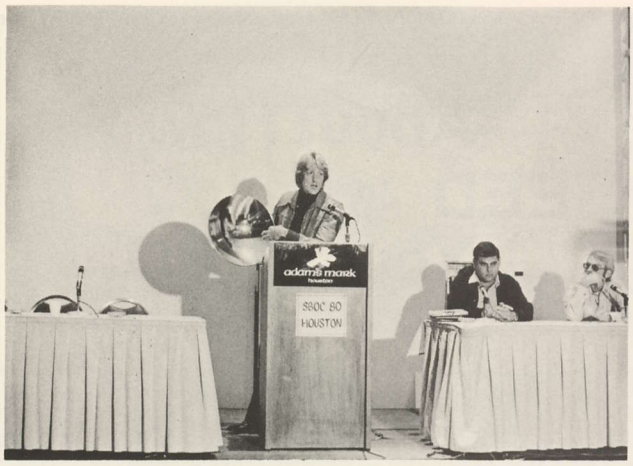
Satellite Cable Company	
Pocatello, Idaho	208-232-2606
Smith Radio-TV	
Ely, Nevada	702-289-4645
Jerry Peake Company, Inc.	
Silver Spring, Maryland	301-587-2515
Red's TV Service, Inc.	
Farmville, N.C.	919-753-3074



BOB LULY explains basic parabolic antenna theory while Bob Behar [right] of A-B Electronics and Hayden McCullough of Vidiark [far right] await their panel turn.

get by with a ten foot dish, this is a package you should look at carefully. It's a winner. Although KLM has been shipping substantial receiver quantities for a couple of months their 'Sky-Eye' package had not been seen by many of us until Houston. Based upon the David Barker image-rejection mixer scheme first published in **CSD** last June, the 'Sky-Eye' receiver works well enough to further complicate the decision making process for the dealer. Here was a non-PLL receiver using technology different than other receivers with obvious advantages (reasonably good quality video) and dis-advantages (a technique for many hard to grasp). Their two-piece package which places most of the electronics outdoors at the antenna seems like a step in the right direction and with production capacities well over 300 per month by the time you read this they are a force to be reckoned with.

Putting more of the receiver at the antenna will become more and more intriguing before the spring SPTS. DEXCEL admitted they were going to be ready around the first of the year (that's right now) with a combination LNA and downconverter unit. It is likely several receiver-LNA combo packages will be ready by spring. In the unfinished business department, the John Rohner unit of similar design that was supposed to be shown at SPTS San Jose didn't show up in Houston either although Rohner did wrangle some floor space in the Tri-Star General booth where he showed off some $695

MOVE THE TREE! Antennas were thicker than beans in Texas Chili pot at the Houston Adams Mark. Next year more order in antenna assignments!

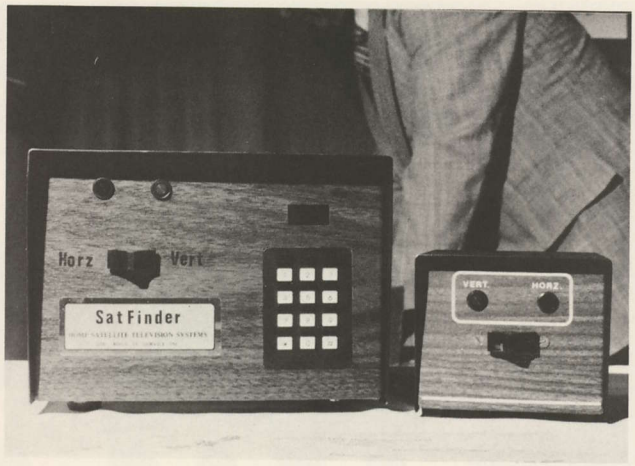
UP AND RUNNING - Clyde Washburn [left] explains fine points of his Earth Terminal receiver [on table to right] to SBOC attendee. CSD **is reviewing a Washburn receiver; a full report in the February** CSD.

'basic receivers'. We heard from several people at Houston who had placed orders with Rohner for his $1500 combo units **last summer**; they were largely upset that Rohner had their money and they had nothing. We tried to talk with Rohner about this at Houston and found him largely non-communicative but **are pleased** to report that **one chap** who had spent $3,000 with Rohner last summer reported the week after SBOC that he had gotten his money refunded.

There were the usual attempts to round up one-each receiver and place them on a single antenna for side by side testing. Those who attempted to hook up two or more of the low-cost receivers with wide open front ends found out why an ICM Purifier is a must item; the receivers inter-act with one another and they need to be isolated from one another as well as from the LNA. As you might suspect the receiver folks largely don't want to engage in a side by side comparison testing exercise and since LNAs and antennas vary so widely it is very difficult for even an experienced observer to wander around the floor looking at pictures and then come to an **accurate** appraisal of what receivers really have the best combination of sensitivity and picture quality. We talked with several people who we know to have experience in this sort of thing towards the close of the show having already done our

NEXT TIME THREE BOOTHS! H & R wrote more than $500,000 in orders at SBOC Houston and found their dual-booth arrangement too crowded to conduct business. At the Spring SPTS they'll 'upgrade' to a trio of booths!

R3 RECEIVER by Ramsey Electronics [Sat-Tec Division] is improved version of original R2 with special emphasis on ease of [mass production] assembly and alignment.

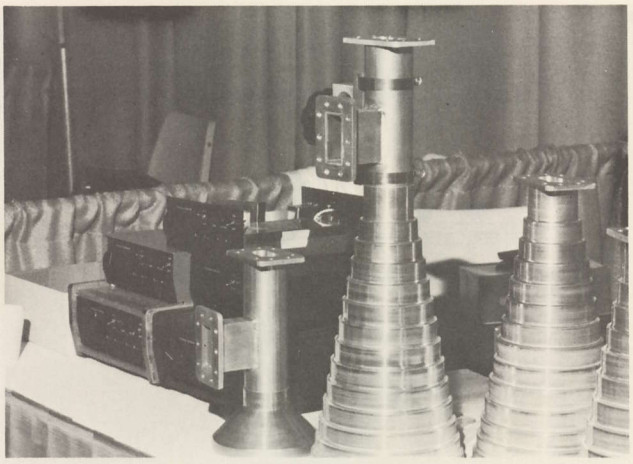


SAT-FINDER digital microprocessor based antenna positioning control is available for antennas to 13 feet in size and can be programmed for up to 20 satellite locations.

own analysis. In this non-scientific evaluation we found a consensus that Andy Hatfield's AVCOM units, Clyde Washburn's units and Robert Coleman's new discriminator receiver were top performers. We did do some side by side analysis of the Washburn and some new Microdyne and MA units and separately between new Microdyne units and Robert Coleman's new receiver. The bottom line in **our personal view** was that we preferred both the Washburn and the new Coleman to Microdyne units. A Washburn unit is now down on Providenciales where it is being tested and we hope to have a

MORE THAN 700 PEOPLE filled the lecture hall to attend the lively sessions including this opening description of the geostationary Clarke-Orbit system by Taylor Howard.

MAN OF THE YEAR HOWARD (left) **with MA's Tom Humpheries and creative Norman Gillaspie participating in SBOC session of receiver improvements.**



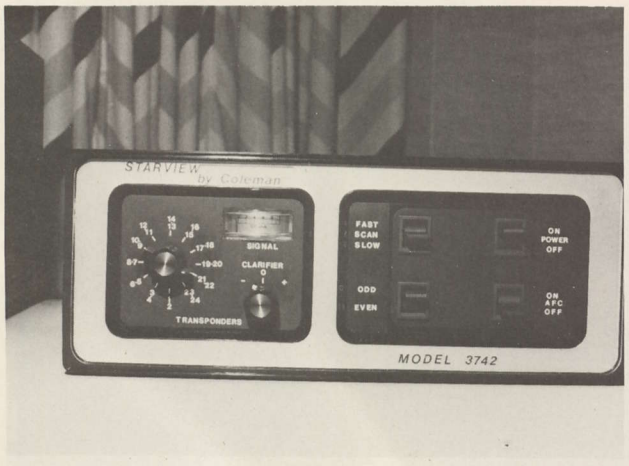
TRI-STAR GENERAL's new line of Spherical feed antennas includes dual-pole (vertical and horizontal) **versions. Yes, they look like over-sized Boy Scout drinking cups!**

report in February. Oh yes, any of the three mentioned costs you less than a Microdyne.

In the lower cost receivers there was an intense effort to get picture quality up along with production quantities. The divide by two PLL approach is now standard at ICM and Sat-Tec. ICM did not exhibit (Royden Freeland did come down for a couple of days however and appeared on the Monday morning TV show) but Sat-Tec found a lot of interest in their R3 receiver. This is a revised and updated version of the R2**A** which started the divide by two approach for PLL units. The R3 is housed in a metal case and the circuit board layout has been cleverly re-designed so that initial receiver alignment and field work is far easier. John Ramsey is obviously concerned about the ability to get into the 500 to 1,000 receiver per month class in 1981.

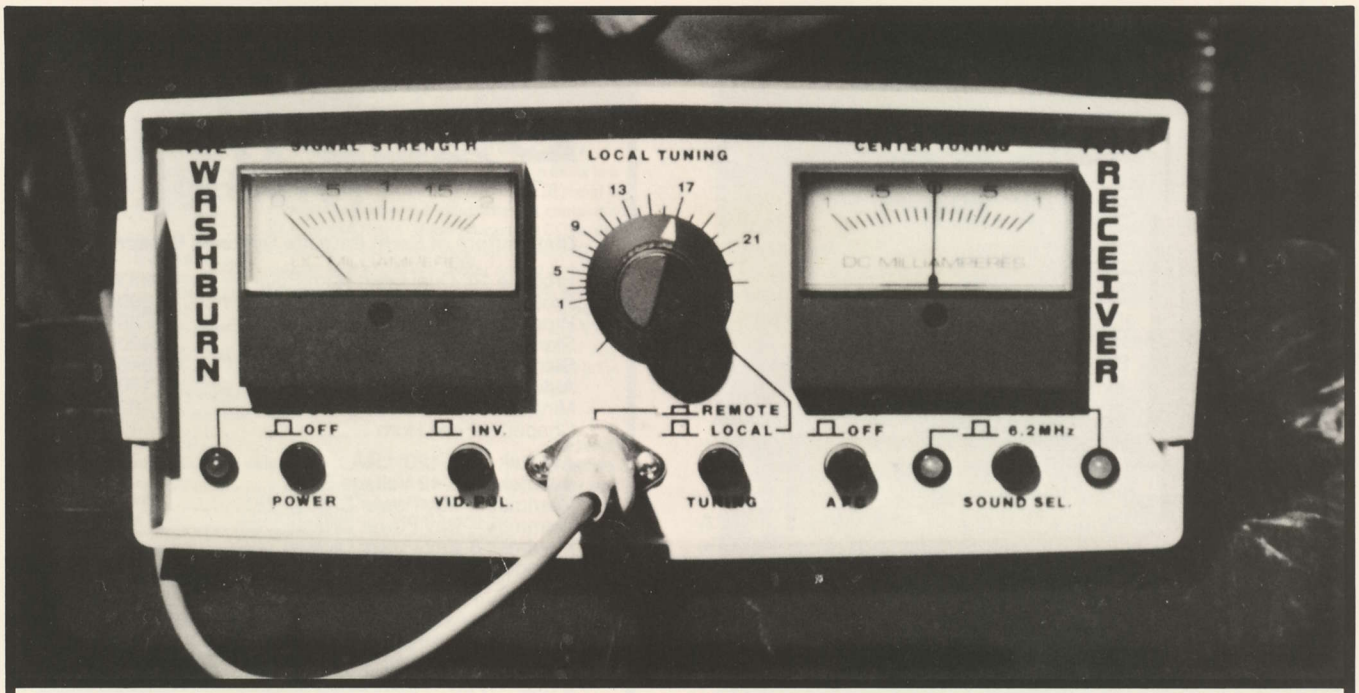
We saw several 'bread boarded' receiver designs in Houston. Each was working, after a fashion, and undoubtedly some of these will show up at SPTS this spring as in-manufacture receivers. The novelty of new receivers has just about worn off by now so we'll await their actual production before we investigate what they are and who is behind them. There still seems to be high interest in 'cheapening' the receiver product, in spite of the problems some have had with $1,000 price range units to date. We hope some of these new receiver manufacturers are as concerned with picture quality as they are with taking out parts.

There was one category of exhibitor at Houston that appeared in quantity as never before. And that was the 'distributor'. STT's new **Coop's Satellite Business Opportunity Manual** defines a distributor as one who buys in large quantity from the OEM (original equipment manufacturer) and then re-sells to a dealer (who in turn re-sells to the customer). The importance of 'buying power' cannot be overlooked in this young industry. When a buyer can corner 50 or 100 radios or LNAs a month from an OEM, he then becomes a force to be reckoned with. Several in this class showed up in Houston anxious to take on dealers. From the new dealer's point of view, the distributor is sort of a cross between a blessing and a necessary evil. The blessing is that the distributor expects to deal in relatively small quantities per dealer per month and he is 'tuned into' such orders. He probably keeps a good stock in depth and will be quick to back up the dealer with replacement gear should something go wrong or not work out of the box. The evil is that distributors buying in large quantities may eventually make it more and more difficult (even impossible) for dealers to deal directly with the OEM. All of the OEM's production may well be pre-sold to some combination of distributors.



STARVIEW [by Coleman] **- This new little receiver package by Robert Coleman attracted lots of interest because of crisp, sharp pictures. Unit features discriminator demod and is available exclusively through H and R.**

AN ADDITIONAL 5000? Coop chats with AVCOM's Andy Hatfield and learns that the pioneer Virginia firm has recently completed expansion into another 5,000 square feet of receiver production space. And they said it wouldn't last!



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- **TRUE EXTENDED THRESHOLD** - 7 dB under full video modulation conditions, achieved through meticulous attention to removing limitations imposed by components.
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SUPERIOR VALUE

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EARTH TERMINALS

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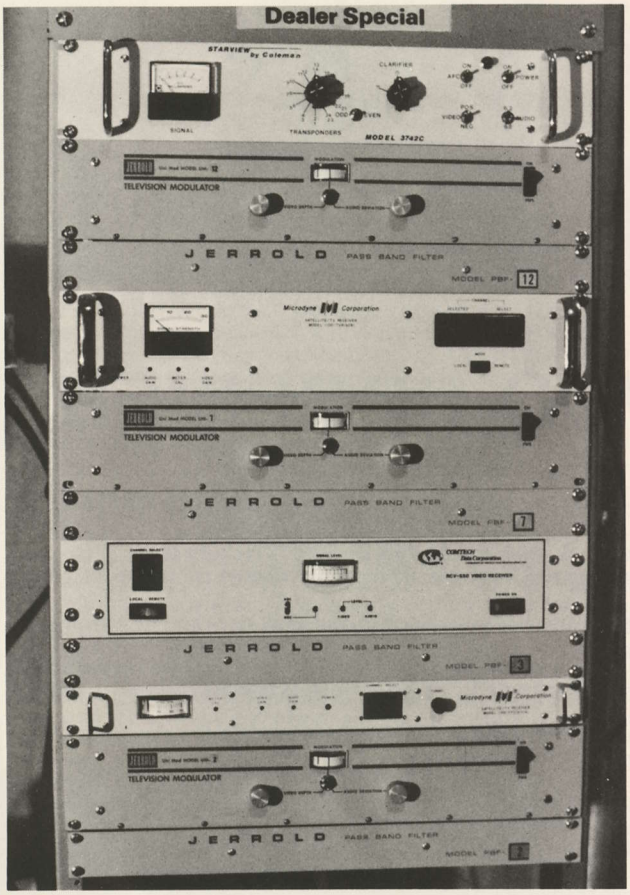
Strong distributors are an asset to any business. Virtually all of the firms entering the TVRO distribution business are new at the distributing game and like any new game there will be mistakes made and procedures to be learned. The number of 'distributors' (some of whom manufacture some bits and pieces as OEMs) grew from three at SPTS San Jose to fourteen in Houston. There is a message here. What that message is we'll all have to wait to see because for now the picture is fuzzy.

Houston Exhibitors:

ADM/Antenna Development and Mfg. Co. - 2745 Bedall Ave., Poplar Bluff, MO 63901. (314-785-5988). James Gowen. ADM displayed their 11 foot antenna equipped with a new hydraulic/electric system for antenna rotation and showed 'expander panels' to turn the basic 11 footer into a 13 foot antenna.

AVANTEK - 3175 Bowers Ave., Santa Clara, CA 95051 (408-727-0700, extension 400). Kenneth McKean. Low noise amplifiers and front end technology.



VERY PROFESSIONAL - H & R stacked up several different receivers and let the attendees form their own on-the-spot analysis of what works best. Two Microdyne units, a Comm-Tec and a STARVIEW by Coleman were in this rack.

AVCOM of Virginia, Inc. - 10139 Apache Rd. Richmond, VA 23235 (804-320-4439). Andy Hatfield. OEM for receivers; distributor for LNAs, cable kits, antennas.

COMMUNICATIONS PLUS - 3680 Cote Vertu, Le Bazar Ctr, St. Laurent, Que., Canada H4R 1P8 (514-337-7255). Nelson Ethier. OEM for receivers, antennas; distributor for LNAs, parts.

DEXCEL, Inc. - 2285-C Martin Ave., Santa Clara, CA 95050 (408-727-9833). Art Kawai. OEM for LNAs; ready to announce LNA plus downconverter package.

EARTH TERMINALS, INC. - P. O. Box 636, Fairport, N.Y. 14450 (716-223-7457). Clyde Washburn. OEM for receivers.

AFTER THE SHOW - Coop and Bob Behar discuss Behar's plans to bring in Leonard title fight in late November. Behar did it but Hialeah police department turned away more than 2,000 would-be viewers who could not fit into his showroom and insisted on standing outside. Behar conducted SBOC session on 'getting recognition for your dealership'.

GARDINER COMMUNIATIONS CORP. - 1980 S. Post Oak Rd., Suite 2040, Houston, TX 77056 (713-961-7348). J. D. Thomas. OEM for receivers, LNAs and antennas.
H & R COMMUNICATIONS, INC. - Route 3, Box 103G, Pocahontas, AR 72023 (501-647-2001). John Hastings. OEM for antennas; distributor for receivers, LNAs, dealer packages.
HAMILTON SYSTEMS - 1101 E. Chesnut (Suite A), Santa Ana, CA 92701 (714-543-5217). Gay Hamilton. OEM for TVRO antennas; distributor for receivers, LNAs.
HERO COMMUNIATIONS (Division of A-B Electronics) - 1782 W. 32nd Place, Hialeah, FL 33021 (305-887-3202). Bob Behar. OEM for antennas, motorized mounting systems. Distributor for receivers, LNAs.
HOME SATELLITE TELEVISION SYSTEM (Division of Rieco TV Service, Inc.) - 6541 East 40th Street, Tulsa, OK 74145 (918-664-4466). David S. MacZura. OEM for automated 10 foot antenna + tracking system; distributor for LNAs and receivers.
ICON ELECTRONICS CO. - 333 McPhillips St., Winnipeg, Manitoba, Canada R3E 2K9. Willard Elliot. OEM for receivers, distributor for LNAs, antennas.
KLM Electronics - 17025 Laurel Rd., Morgan Hill, CA 95037 (408-779-7363). Peter J. Dalton. OEM for receiver.

WHAT IS IT? STS of Missouri's full size dish filled their booth - and then some!

MICROWAVE ASSOCIATES COMMUNICATIONS - 11211 Katy Freeway (Suite 215), Houston, TX 77079 (713-827-0303). Tom Humpheries. OEM for receivers; (Prodelin) antennas; distributor for LNAs.
MID AMERICA VIDEO, INC. - 1317 N. Hills Blvd., North Little Rock, AR 72115 (501-753-3555). Gene Mullenax. Distributor for TVRO systems.
NATIONAL MICROTECH, INC. - P. O. Box 417, Granada, MS 38901 (1-800-647-6144). Dave Fredric. Distributor for TVRO systems.
STS - Satellite Television Systms - P. O. Box 1181, Poplar Bluff, MO. 63901 (1-800-325-0781). Roger Hogg. OEM for TVRO antennas; distributor for receivers, LNAs.
for receivers, LNAs.
SATELCO - 5540 W. Pico Blvd., Los Angeles, CA 90019 (213-931-6274). Sam Kleinman.
Satellite Video Systems - P. O. Box 673, Cabot, AR 72023 (501-843-7358). Bobby Kaylor. OEM for TVRO antennas; distributor for LNAs, receivers.
Sat-Tec (Division of Ramsey Electronics, Inc.) - 2575 Baird Rd., Penfield, N.Y. 14526 (716-381-7265). John Ramsey. OEM for receivers, hardware and parts; distributor for antennas, LNAs.
SPHERE SAT ANTENNAS - 453 W. Freeway, Roseburg, OR 97470. OEM for TVRO antennas.
TRI-STAR GENERAL - 4810 Van Epps Rd., Brooklyn Hgts, OH 44131 (216-459-8535). Dave Yanko. OEM for TVRO antenna feeds, antenna mounts; distributor for antennas, receivers and LNAs.
STARPATH, INC. - Route 1, Box 188, Fisk, MO 63940 (314-967-3201). Distributor for TVRO systems.
VIA CABLE, INC. - Box 552, Ingram, TX 78025 (512-367-5714). James W. Priour, III. Distributor for TVRO systems.
VIDIARK ELECTRONICS - P. O. Box 57, Salem, AR 72576 (501-895-3167). Hayden McCullough. OEM for TVRO antennas; distributor for LNAs, receivers.
WATKINS-JOHNSON - 440 Mt. Herman Rd., Scotts Valley, CA 95066 (408-438-2100). Val Johnson. OEM for TVRO receiver components.

GETTING ON THE AIR

BACKYARD TV STATION?

Among the more interesting SBOC '80 Houston sessions was one conducted by Michael Couzens of the Federal Communications Commission where he and SPACE Counsel Rick Brown investigated the recent FCC decision proposing that virtually anyone could be licensed for their own 'neighborhood' television station using power levels as low as 1 watt (!).

The Carter FCC, bent on deregulating virtually every aspect of communications so that more 'voices can be heard' proposed this past fall sweeping changes in the FCC rules so that an individual, corporation, community of other entity could receive from the Commission a license to establish and operate very low power television stations on any unused VHF or UHF channel in their area. For those who might not recognize the significance of this proposal, let's put it several different ways:

1)You live in a suburban area. You have a TVRO. You want to 'share' the reception with a few (hundred?) neighbors. You would be able to get a license for a very low power station to do so.
2)You live in the boon docks. You have a TVRO. You want to share your TVRO reception with a few ranchers around you. You could get a license to do so.

Under the FCC proposal **first** you have to find a channel **not in use in your area** (any channel from 2-69 is available; you have to show that in operating on that channel you won't cause interference to other **primary** TV stations on the same channel or to stations on adjacent channels). Then you have to file with the FCC an application to construct and operate the station. In that application you show who you are, what your station will consist of, how much it will cost, and how you propose to fund the construction plus operation for the first 90 days.

The FCC actually acted on two broad proposals at the same time. One allows 'low power' TV stations to be built operating with up to 1,000 watts transmitter power. Most of these will end up in the UHF band simply because that's where most of the clear channels are located. The FCC was treating **this** new class of station like a regular TV station except without the mountains of paperwork as the Carter FCC wrapped up its activities. There was a genuine rush to get some of these stations on the air and established before the Reagan adminstration took hold. At the **same time** the FCC proposed to do away with many of the rules which had restricted use of VHF and UHF TV **translator** stations; rules that prevented translator stations from engaging in local programming, prevented use of satellite fed signals and so on. It is this later class of stations which we dub very-low-power (or **VLP**) stations which interests us most here at this time.

The FCC's Michael Couzens, appearing at SBOC '80 Houston, explained that while the rules are in a proposal stage he felt the FCC **would act** on new applications in this area on a **'rule waiver'** basis. That is, while the formal change of the rules has not been acted upon, those asking for such station construction permits and licenses would be able to go into operation by asking the FCC to waive the present rules.

The potential for such VLP stations fairly boggles the mind. But there is a caveat for as SPACE Counsel Rick Brown pointed out there is at least one 'hitch' in the rules (even after deregulation) which may make the final thrust of the rule changes 'a cruel hoax'. So what is that bad news?

Translator rules have always required that the translator station operator must have the written permission of the TV station being rebroadcast to rebroadcast that station's programs. You cannot put in such a translator station and plug into WTBS for example. **Not unless** you have the permission of the station to extend its signal into wherever you are. SPACE's Brown is concerned that many of the more desirable signals available via satellite **may withhold such permission** just as they do for MATV and condominium and private direct viewing now. So there is that 'problem', yet to be resolved.

Just how much of a problem is it? Suppose you want to be the first one on your block with your own TV 'station'. You have the FCC license application forms and you have filed them. They are even filled out properly. Now what do you do about programming?

1)Michael Couzens says you do not have to program any **minimum** number of hours per day. That means that you could 'hold the license' by being on the air only a short period each day.
2)Since the FCC's proposed rules eliminate any reference to **types** of input signals that could be re-broadcast, that means you could simply air a test pattern or (cleared) material from a ½'' tape deck. A TV camera propped up in the front window of your home showing the street outside would even be permissible!
3)Of course not all of the present satellite signals are uncooperative for private viewers. CBN, PTL, Trinity for three are anxious to have viewers and any or all three can be expected to grant you the authority you seek. A careful mixture of all three might make an acceptable programming day for example.

Additionally, the Commission also proposes that you be

allowed to 'scramble' (as in encode) your transmissions; either all of the day **or** part of the day. That should immediately give you some ideas about making your VLP station 'pay off' since this offers you a way to 'sign up subscribers' rather than give your service away or have to mess with the selling and creation of 'advertising'.

Humm. So just what might it take to get on of these VLP stations on the air? By the strangest of coincidences the system the FCC now has in the works is almost precisely the system described on pages 17 to 21 of **Coop's Satellite Operations Manual**. And by even stranger coincidence, virtually the identical system is in use down in the Turks and Caicos Islands for West Indies Video.

Well, it can be done very-very inexpensively. Let's look at what an astute reader of CSD might put together such as a ten watt VHF channel VLP facility for using hardware now on the marketplace :

1)10 to 14 foot TVRO reception system with 120 LNA and tuneable receiver - $3,000.
2)Anderson-Scientific 10 watt VHF translator - $1600
3)Blonder Tongue TVM series modulator - $800
4)50 foot Rohn 25G type tower, base and guying materials - $300
5)A pair (one may be all that is needed) Jerrold MATV series five element yagi antennas, coaxial cable - $200

At this point we have a $5900 investment and ten watts of VHF RF on the air. What can you do with it? Cover out to 5-10 miles in all directions on what is essentially a line-of-sight system.

Now suppose you wish to add the ability to do local program origination? With a modest system you can generate a standard NTSC color bar pattern, switch neatly from your satellite feed to your NTSC generator (tone is built in), or go to a ½'' (industrial grade recommended) VHS or BETA deck and do studio or on-tape presentations with a reasonably high quality consumer color camera. It would require the additional expenditure of:

1)Vertical Interval Switcher (available from Panasonic, and many others) - $600
2)NTSC generator (B and K) - $700
3)½'' industrial grade deck with direct drive - $900
4)Panasonic PK700 camera - $700

Some of these are discounted pricing but all have been noted in trade literature in the last sixty days. In this area we now have an additional $2900 invested.

What about the scrambling aspect of the package? Well, as **CSD** readers know there are many types of scrambling systems about. One of the simplest that is effective (although hardly theft proof!) is the interfering or jamming carrier technique first made famous by TEST and later brought out by other suppliers to the cable trade. The transmitter scrambler should cost you:

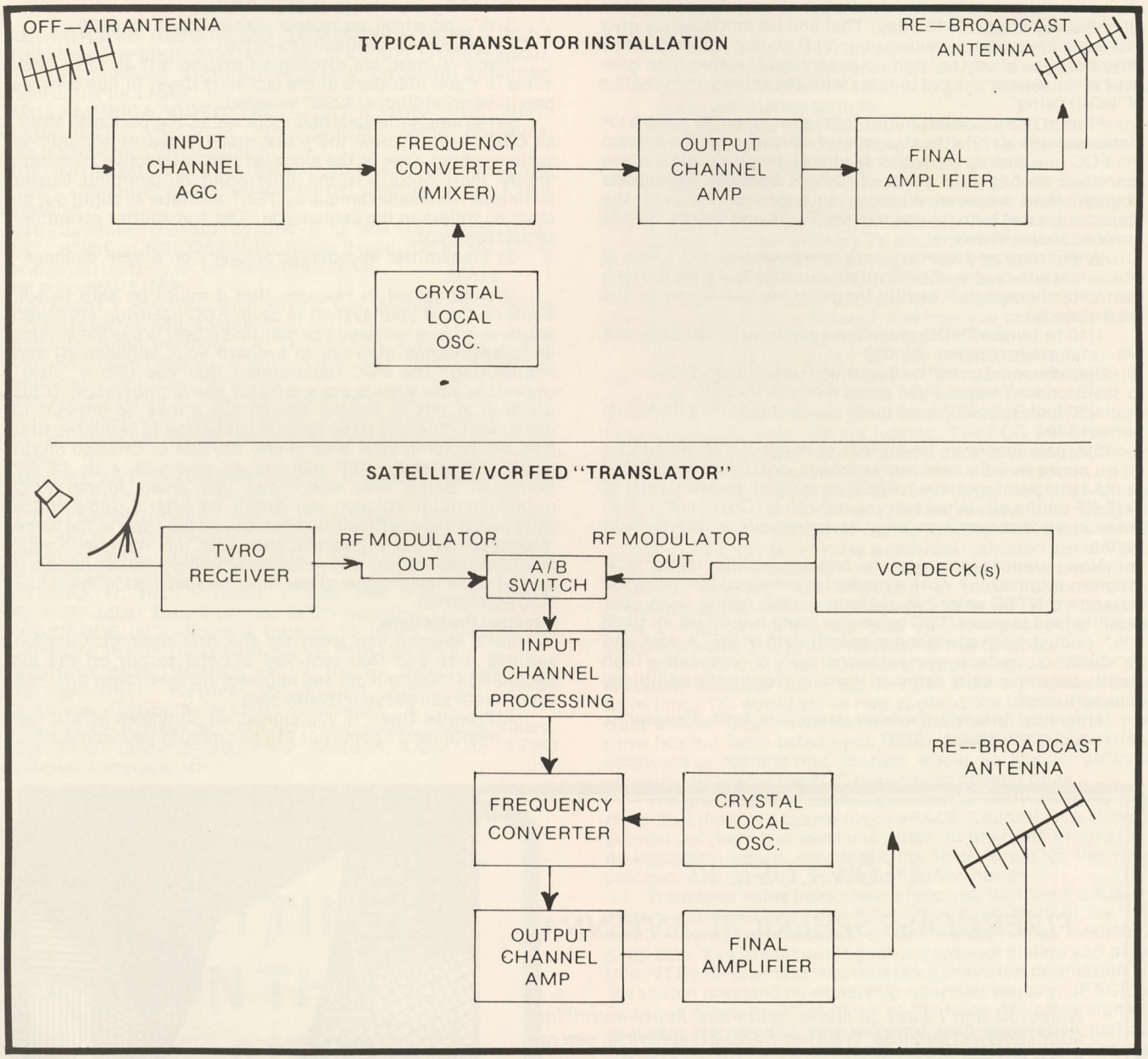
1) Transmitter encoder/scrambler - on a VHF channel - $1500

We suggested in Houston that it might be safe to add $1500 on top of your system to cover FCC licensing (although you have no fees involved you may find it best to use the service of a Washington attorney to prepare your application) and engineering. The FCC requirement that you find a 'clear' channel in your area is not a difficult one to understand (**CSD** will look at this in coming issues) but it may be difficult to implement. There is some tactical advantage to being the first onto a channel in your area (a city the size of Chicago might handle 25 or more VLP stations **on** channels 4 or 13 for example). Being first won't buy you much formal FCC protection but it will give you certain squatter's rights which will make it more difficult for others to sit atop you in the same 'neighborhood'. If you cannot cope with this issue with your own background, you'll have to hire someone who can handle it for you since the channel of use must be specified in the initial FCC application.

Revenue Projections

Let's assume you went for the first-class VLP station outlined here and that cost you $11,800 to put on the air (including $1500 for legal and engineering fees). Now how and when might you get your money back?

A)**Premise One** - If you signed up 50 homes at $10 per month (or 37 homes at $15 per month) you would have



$500 gross per month. If you allocated 50% of your revenues to pay for your programming costs (a realistic figure if you happen to be able to carry a premium service channel off of satellite) and assigned another $50 per month to operating costs that would leave you with a mighty $200 per month 'net'. And that would take you 59 months (jut under five years) to pay off the initial $11,800 investment.

B) **Premise Two** - Same system going in but now service 100 homes at $10 per month (or 66 homes at $15 per month). Now it will take you 30 months to pay off the system investment.

C) **Premise Three** - Same system going in but now service 500 homes at $10 per month (or 333 homes at $15 per month). The pay off period for the initial $11,800 equipment investment is now six(!) months.

The FCC rules preclude you from owning and operating more than a single such VLP station in the same service area. However if one could calculate that it would take 25 such stations on say channel 4 to envelope the greater Chicago area, with none of these 25 channel 4 VLP stations having substantial coverage 'overlap' there is nothing in the proposed rules to prevent one person or group from owning and operating all 25 such stations (if they could get the licenses for same).

So where does that leave you? Probably wanting to know more. The February issue of **CSD** will look into all of this further but in the interim period you should contact the FCC

SOUTH PACIFIC REPORT

I thought **CSD** readers might be interested in a report on the new Australian domestic activity utilizing Intelsat over the Pacific from a would-be-viewer who does not live in Australia proper.

1) Both halves of transponder 3 are now operational on a full-time basis. They are utilizing a spot beam (bore-sighted near Alice Springs-ed.).

2) We had been rumored to expect 24 dBw here in the New Herbrides (Vanuatu). To say the least, I believe that number is overstated. On the local professional earth station (45 foot dish, 70 degree K LNA) the pictures are

TECHNICAL CORRESPONDENCE AND NOTES

very noisy.

3)The Australians are also leasing 1/2 of transponder 5. They carry just about all of the Australian TV network programming here on a Global beam. Now according to professional data the EIRP here on this (Global beam) transponder should be 22 dBw. The pictures on the above mentioned 45 foot antenna system are exceptionally clean on this 1/2 transponder channel.

I have it on good authority that the transponder 5 activity is set to go at least through March of 1981. The primary unresolved question is what happens after March with this (stronger here and in many parts of the region) signal? When the Australians announced they had decided to go with one or more spot beams to cover the continent there was an uproar from countries (such as mine) which lay just outside the useful (spotbeam) service contours. Certainly Australia has no legal requirement to provide live television to other areas such as this but it turned out that many of these nations and islands were **counting on** having that service available. It turns out that the 22 dBw signal, while not strong, is giving these nations an opportunity to evaluate live TV service (which none have at present). The programming on transponder 5 is typically 'batched'; several hours of soap operas ('Days of Our Lives', etc.) followed by several hours of news and so on. Apparently there is no regular terrestrial re-use of the transponder 5 signal since programming often simply cuts off in the middle of a program (such as the late night movie) and they switch to a color bar pattern.

With my own homebrew system I have only managed to get sync bars on transponder 5 (and nothing on 3). I am using a GHz Engineering (now KLM) receiver unit which uses a discriminator type detector. I know it is regarded as a 'cheapy' receiver (but not by my wife!) but I hesitate to invest much more into this until the Australian government makes up their mind as to what they do intend to do. I feel that a PLL demod would certainly have a better threshold which would probably give me something better in picture. I have searched around but can only find 'CCIR de-emphasis' circuits which does not help my 4.43 (etc.) MHz PAL standard requirements. I feel I am far enough into this now to make the system work properly but could use some sound advice from people who understand what it is we are facing here in the South Pacific.

Peter Duddy
YJ8PD
P. O. Box 349
Port Villa
Vanuatu (New Hebrides)

For those with Ham radio capability Peter can be found on 28.885 MHz Saturday or Sunday morning (GMT). **He could use some assistance.**

SURPLUS TEN FOOT DISHES

Around the first of February a quantity of 12 10-foot spun-aluminum single piece Gabriel dishes will be sold as surplus by the Mountain States Telephone Company. Original cost per dish was around $6,000 (!) but they will be sold for around $300 each. There is no mount or feed involved. All are in Montana at the following locations: Black Eagle (2), Great Falls (2), Raynes Ford (2), Denton (2) and Judith Peak (2). The dishes are rated 'good' to 11 GHz (probably 12 as well) and contacts regarding their purchase should be directed to Gil Strachy (303/624-1813) or Del Gremel (303/624-5911); both in Denver.

John Tutt
Pioneer #195
Telluride, CO 81435

A photo of John's 10 foot Gabriel dish appeared on page T16 for last November. One caution - the f/D on these dishes is in the .3 range and feeding them efficiently requires some special work.

12 GHz RECEIVER

I am the director of a college media center here at Vanderbilt and am very interested in the 12 GHz satellite service as a future project. Do you know of anyone who has built a 12 GHz receiver yet? Does Microwave Associates have a Gunn oscillator-mixer unit at 12 GHz?

Henry Savage
Media Center
Vanderbilt University
Nashville, TN 37203

The world of 12 GHz is 'wide open'. For now, because the only North American service is via ANIK-B and it is reported to be not generally receivable below the northern 1/3rd of the US (and then the two spot beams for western and east-central Canada create big 'holes' in the US coverage), **there has not**

been much interest in 12 GHz. However with the new INTELSAT V birds slowly coming on line (with 12 GHz operation capability) **and the eventual** (perhaps 1988 or so) **US domestic service there, it will come. MA Gunnplexers 'skip' over the 12 GHz region although Gunn sources** (in their **commercial** equipment line) **are available. A 10.5 GHz frequency range Gunn source** (i.e. Gunnplexer) **could be used as a low-side LO to mix the 12 GHz signals down to say 1200 MHz for a standard high IF as used in dual conversion 4 GHz receivers. Or, you could use a 8 GHz source to mix down to 4 GHz so the standard 3.7 to 4.2 GHz receiver would be used as an 'IF'. Steve Birkill in England does have a homebrew, operational 12 GHz system and as time permits he is putting together a** 'Manual' for STT on this topic.

INFLATABLE 4 GHz ANTENNA?

You may be interested to hear about a new type of microwave antenna dish which I have designed and for which a patent has been filed. The new dish is designed for the 4 GHz band and is made of plastic which is inflated to form an accurate reflector with interior metallic coating. The plastic is formed in a mold and attached around the circumference to a drum-like stiff support member steerable in azimuth and elevation. I am hopeful, since our primary work is R and D, of locating an antenna manufacturer who will be interested in taking our design and turning it into a commercial product.

William Hotine
31701 Middle Ridge Rd.
Albion, CA 95410

An inflatable TVRO antenna was first proposed back in the early 70's by some chaps at Stanford. A group in Texas built up a couple prototypes as recently as 1978 but there were some structural integrity problems with their design and it quietly disappeared.

Avantek Correction: The December **CSD** carried an analysis prepared by Taylor Howard of LNA out of band noise. That report indicated Avantek would retrofit existing LNAs with a filter system to eliminate noise which can cause problems with low-cost receivers. Avantek advised Taylor Howard this is in error - existing LNA will **not** be factory retrofitted. We apologize for this error in the December report.

TECHNICAL NEWS NOTES

WASHBURN decision to no longer accept kit orders for Washburn TVRO receiver. Firm made 'difficult decision' after analyzing amount of time being spent assisting would-be kit building to get units operational, determined high percentage of people ordering kits were 'wrong people' (i.e. not really qualified for complex kit project).

$695 BASIC receiver from John Rohner crept into SBOC '80 booth space occupied by Tri-Star General. Unit apparently replaces earlier 'combo' unit which was to include LNA plus receiver in single antenna mounted package. Rohner offered some who ordered combo units the new 'Basic' receiver **plus** LNA in trade for their $1500 deposits on the earlier announced 'Combo' units.

ATTRACTIVE Teknimat reciver first unveiled at SPTS San Jose closer to production at Houston but not ready to ship. Firm reported fifty sets of complete boards and parts were in production and they expected to be shipping units about the time you read this.

If YOU are seriously interested in applying for low-power TV station and are uncertain how to go about selecting channel for application and use COMPUCON (firm doing much work in analying satellite terrestrial interference) now offers channel search service. Call Dan Yost at (214)233-4380. Note that VHF VLP (very low power) stations with 1 to 10 watts power are licensed on a non-interference basis; something you can usually determine with 30 minutes study in your area.

INITIAL launch of Space Shuttle now looking more and more like it will be in first two weeks of March. Uncertain operational dates still causing major concern among next generation satellite operators who feel they must have hard dates to plan their own activities.

LATEST MOLNIYA launch (number 48) went off apparently without a hitch in mid-November. Russians typically maintain 4 active Molniya birds and between two and four backup birds in active inclined orbit. Re-scheduled Ariane launch schedule after failure last spring includes APPLE communications satellite this March adn SIRIO 2 (Italian) communications satellite in October.

UPDATE reference readings on Ghorizont II Russian Clarke orbit bird at 14 degrees west suggested by English observer Steve Birkill. European observations suggest Russians may have re-configured footprints (from ground control). Formerly, during Olympics, Russian transponder 4 was strongest in Europe. Post-Olympics transponder 1 now much the strongest. Observations of present levels or before and after levels should be sent to CSD.

CONFIRMATION that Molniya apogee is not at most northerly point in path but rather on southbound side of loop. Molniya theroretical six hour transmission period has always been assumed to the split evenly around apogee/loop (apex). **Not so.** Both apogee and mid-point in transmission schedule occur beyond 'loop' turn-around.

CONCERN that President-elect Reagan may freeze exporting of 'sensitive' satellite technology to China has American firms scheduled to sell hardware there worried.

COOP'S COMMENT ON PROGRAMMING

THE QUALITY GAME

If one wandered from booth to booth at Houston's SBOC '80 it quickly became apparent all TVRO systems are not created equal. No test equipment is required to see with your own eyes that some pictures look good, some don't look so hot. Sifting through the pictures, separating out those that look bad **because** the antenna is too small or the LNA is too high noise or the system is simply pointed at a bird that does not have a decent footprint in the area is no easy task.

There were 21 operating antennas at Houston. Most of these were crammed into an area perhaps 300 foot by 200 foot on a side. There were a few delicate moments when during initial set up a supplier attempted to stick a large antenna directly in front of a small one thereby blocking the small antenna's view of the bird.

Several of the more talented exhibitors noticed that as more and more receiving antennas came on line late Sunday and early Monday the general picture quality on their own installations actually degraded. A real novice at this would have suggested that the antennas were 'sucking up' the available signal level. Of course that does not happen; the only signal an antenna can capture is the signal that lands directly on its reflector surface.

Still, **something was happening** as more and more systems began operating. If there was an award for cramming the most antennas into the smallest space, SBOC '80 got it. So what was actually happening?

After the show was over most of the antenna folks rushed out to begin knocking down their arrays. One, however, waited until the rest were finished. Tom Humpheries, representing Microwave Associates Communications in the Houston area, had made some definitive measurements of his ten foot antenna signals with a spectrum analyzer several times during the show. Now with the show over and the balance of the antennas gone Tom repeated these measurements.

What he found might well make a dandy in-depth article here in **CSD**. On the bottom line however was this:

1) As more and more antenna systems became operational the noise floor from the region surrounding his antenna system went up. Much of the noise was actually RF noise coming from the **receiving** equipment in use.
2) In particular, in-band carriers coming from (Tom suspects and we agree) the wide-open front ends on 'low cost receivers' muddied up the 3.7 to 4.2 GHz band.

Way back at SPTS '79 in Oklahoma Paul Shuch, Robert Coleman and Taylor Howard warned against the use of single conversion receivers with wide open front ends. Shuch in particular was concerned that people 'experimenting' with TD-2 surplus units and operating without adequate LNA selectivity ahead of the TD-2 would be transmitting healthy signals in the 3 to 5 GHz band and could possibly cause interference to important communication services.

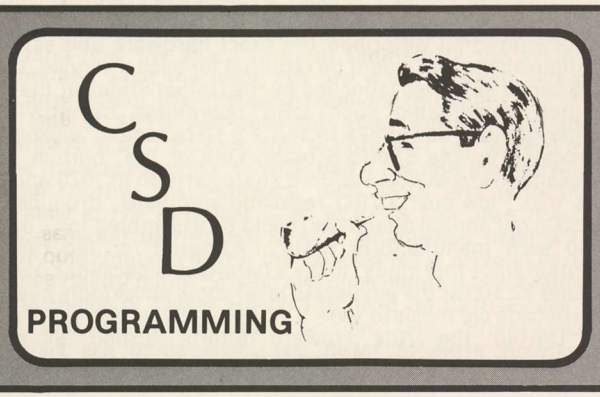
The Houston problem was not apparent to most exhibitors; in the rush of setting up a new location and having no prior experience at that location many people simply wrote off the noise level as a site problem. Humpheries, a veteran in this business, instinctively knew there was more involved.

Single conversion receivers can be difficult to 'tame'. We would like to see some hard measurement numbers from suppliers of these units regarding just how much energy is leaking back out of the input. Double conversion receivers without input pre-selection should be run in a crowded environment like this **only when** they have a device such as the ICM Purifier in the line.

Granted SBOC Houston was a worst case situation. It will be many-many years before home terminals so proliferate that neighbors are likely to cause problems for one another. On the other hand there is no real excuse for this type of problem and the time to correct it at the equipment design level is now before consumers in close proximity to one another begin experiencing strange noise floors and interfering carriers that drift in and out of their pictures.

As a dealer in this hardware you can have similar problems, on a lesser scale, when you have a couple of antennas operating at your business. If you are into multiple antennas and notice that pictures seem to vary in quality from day to day and hour to hour, you can isolate your own problem by simply plugging in and pulling out various pieces of gear. Chances are you will have fewest problems when you have a single antenna, LNA and receiver operational. And if you are attempting to run two or more receivers off of a hybrid splitter and you notice interaction of any sort chances are you need to put some selectivity in front of the receiver units.

Dealer and user-feedback to manufacturers will play an important role in getting this situation cleared up. If we only hear about it during SPTS/SBOC events the manufacturers are not going to consider it a serious enough problem to investigate and correct. As always, the consumer speaks the loudest of all.



COOP'S SATELLITE DIGEST (Programming Section) is published monthly by Robert B. and Susan T. Cooper doing business as Satellite Television Technology (STT). Editorial offices located at West Indies Video, Grace Bay, Providenciales, Turks & Caicos, BWI. Communication with editorial office is through Business Office at P. O. Box G, Arcadia, OK 73007 (405-396-2574); Rick Schneringer, Manager. Photography, Kevin Paul Cooper; editorial assistance Tasha Anne Cooper. STT produces various manuals, videotapes, guides and texts plus conducts the twice annual SPTS and once-annual SBOC events. STT is not affiliated with any manufacturer or distributor of satellite communications equipment. **CSD** subscription $50 per year US / Canada / Mexico; $75 elsewhere.

TAYLOR HOWARD RECOGNIZED FOR LEADERSHIP

MAN OF THE YEAR

We first heard of Taylor Howard's activities at a cable TV trade show in Southern California. It was late in 1977. ''Your private terminal is not the only one operating in the states'' the cable engineer said to Coop. We acknowledged that there were probably many others. ''I have a neighbor, a Professor at Stanford, who has a private terminal operating. He built it all himself and he distributes the satellite programming to several of us using 10 GHz 'ham band' microwave'' the engineer went on. We naturally asked for more details and the identity of this amazing individual. When we again saw the same cable engineer a year later at the same trade show we asked how the Professor was doing. ''He keeps improving his system'' was the response. The detailed description of the system began to attract some interest from us and we saw to it that the Professor received some literature from **CATJ**, the cable magazine we were editing at the time. Actually we had already been in contact, and had published a photo of Professor Howard's system in CATJ. It was during 1978 that **CATJ** dealt extensively with the development of low-cost (by '78 standards) TVRO receiving systems and while some in the cable industry found our coverage of low-cost (as in **private**) terminals 'dangerous' there were many more cable people who saw the potential for low cost terminal equipment as a natural adjunct to established cable operations.

Howard's accomplishment, creating a home-brew terminal from scratch (modified surplus antenna, home-brew LNA and totally home-brew receiver) was beginning to attract interest from many other would-be experimenters. Because Tay is a Ham operator (W6HD) his achievement in this area was hardly secret. Word of what he was doing spread through amateur channels around the world and pretty soon he was up to his eyeballs in mail and phone calls from other hams who wanted to know 'the secret'. In response to this deluge of inquiries Tay set out to create a 'manual' that described his sytem.

The first manual consisted of a professorial treatise on what geo-stationary satellites were and how they did what they did. Following this was a description of the various modules or sub-sections in his LNA plus receiver package. Many present day pioneers, such as Clyde Washburn, acquired this historical manual and set out on their own to create similar systems.

We first visited Tay Howard in May of 1979. His California home is some 100 miles or so from Stanford University, where he is engaged in research projects and Tay 'commutes' several times per week between his mountain home and Stanford with a small single engine airplane. Much of his original research work is done at home and he highly values the privacy and peace of the lovely mountainous area where he, wife Annie and their teen-age family reside.

Taylor likes to create useful, functional apparatus out of raw materials. His home, seemingly precariously perched atop a low mountain ridge is a working ranch. The entire family participates in running the several hundred acres which boasts cattle herds and horses. Tay and the family created every inch of it themselves painstakingly wrestling raw mountainside back from mother nature and putting it into useful production again.

Taylor likes to tell the story of his entrance into the space age. He was in Uncle Sam's service at the time the Russians launched Sputnik. The first Sputnik. Like many ham radio operators he was terribly excited to be able to receive the beacon transmissions from the first manmade space object and he rushed to his Commanding Officer to play the sounds of the beacon on a wire recorder. After playing the recording Howard asked his CO for an early discharge so he could rush back to Stanford to get busy with helping America respond to the Russian initiative. The CO listened patiently, and then denied Tay's request. ''It is probably just another Russian trick, son'' he said ''and besides, if it is not, it will never amount to anything anyhow''.

When Tay did get out of the service he returned to Stanford. And he went to work getting himself involved in the US space effort. For example, during the early 1970's NASA commissioned Stanford University to study the feasibility of 'direct broadcasting satellites'. A group of advanced students including Bob Taggart of today's Chaparral Communications tackled the project and developed the now benchmark white paper study that described the exact hardware and satellite configurations that would be required for such a service. Later ATS series satellites launched by the United States in that era further investigated such DBS operations by providing 'experimental' downlinks in the 2.6 GHz region; a program advocated by the Stanford team. One of the 'bottom line' assessments from that Stanford study, written in 1970 and 71, was that ''low cost TVRO receiving terminals, produced in 100,000 per annum quantities, could be assembled for under **$350 each** manufacturer costs''. Allowing for the rate of inflation since that study, today's bare-bones packages costing around $2,100 at the **wholesale** level come shockingly close to that decade old thesis in 1981.

During the 70's Howard efforts turned to more sophisticated systems. He worked on space probe programs and problems for the California Jet Propulsion Lab (JPL) and

his favorite 'baby' was an Antartica weather surveillance system. Remote weather sensors, spotted in regions of the south pole where raw climatic conditions were thought critical to an understanding of weather throughout the southern hemisphere, were created and assembled by Tay and then taken to the south pole region by he and his team. The data was transmitted in real or near real time back to the United States via...you guessed it...satellite relay.

Taylor's interest in low-cost TVRO terminals started when a student drew his attention in 1975 to the pioneering efforts of RCA and WESTAR. "There is television programming on those satellites, every day" the student related. Taylor's mind drifted to a pile of aluminum and steel stored behind one of his barns at his mountain home. In that pile was the guts for a 15 foot parabolic antenna and motorized mount. He had picked up the surplus equipment for pennies on the dollars years before certain that some day he would find a use for it. The equipment had originally been operational on a US Navy vessel.

Enlisting the aid of a couple of teenage sons the pile of metal again became an antenna system. The surface was coated with expanded aluminum mesh and his youngest son worked inside the antenna (because he was the lightest in the crowd) while Tay and the rest of the family worked below to stretch and tie off the surface to 4 GHz accuracy. The first satellite receiver was a modified and re-worked piece of surplus telephone company equipment; the same TD-2 that would later provide the inspiration to another pioneer, Robert Coleman.

"The first picture was just awful, by today's standards" relates Tay. Awful or not, it provided a starting point and the bright red screen with white letters carried a message very appropriate to the first reception by Howard. "Attention All Earth Stations..." the slide began. "It sent a shiver down my back and I knew I was hooked for life" he remembers.

Howard's interest in private, low-cost terminals began as a challenge to his talents and because he liked challenges he tackled it with as much spare time energy and talent as he could muster. By the middle of 1979 however the spare time activity was beginning to overload his already busy schedule. "Stanford has always been very tolerant of my wide range of interests" he relates "but as my employer they ask for and are entitled to my undivided interest when projects are underway". Well, when you have a growing family just entering their expensive college years and obligations at a professional level all over the globe the pressures that can be exerted on a man are considerable. "I really wanted to ask Stanford for a leave in 1979" notes Tay "but common sense told me that this was not the right time". It was not. The private terminal industry, hungry for the kind of consulting talents Tay had to offer, was simply not in a state of maturity to handle a full-time devotion of Taylor Howard. And so he set out to refine and codify his basic receiver design hopeful that out there in the marketplace there would be a manufacturer who would take it into production on a royalty basis.

Taylor's unselfish devotion to 'the cause' was apparent from the very first SPTS. He, Robert Coleman, Paul Shuch and others willingly appeared on the SPTS program and made themselves available unselfishly to the hundreds of attendees who came eager to learn from 'the masters'. Since the first SPTS Tay's basic-technology seminar sessions have paved the way for neophyte attendees to better understand how the space to earth segment of the system functions and what the trade offs are when one sets out to design an effective, low-cost earth receiving terminal.

It was at SPTS San Jose this past summer that the founders of S.P.A.C.E. were able to persuade Tay to head up the new trade association. SPACE had a floundering start-up in Miami during the February 1980 SPTS and with the appearance of HR 7747 just prior to SPTS San Jose it was quickly apparent that unless SPACE established itself with authority and clout in a hurry, the low-cost (as in private) earth terminal industry might be dead and gone before it ever began.

The choice of Taylor Howard to head up SPACE was a logical and well reasoned decision. His professional credentials are immaculate. His down to earth practical approach to low-cost hardware has set the tone for the entire industry that has followed in his footsteps. His command of the technology and his ability to work with both technical and non-technical people is legendary.

Now functioning on an 80% leave status from Stanford, Tay's visibility in the low-cost TVRO field has continued to expand. And in spite of his increasing role as industry head through his SPACE presidency his concern for the nitty-gritty of the hardware development continues unabbated. For example, through a consulting arrangement with a California firm he designed the first working divide-by-two demodulator system for the PLL receivers. Or, aware that for some then unexplained reason that receivers in the low-cost field refused to work properly no matter how good an LNA preceded them, he analyzed the marriage of LNAs and receivers and discovered that some LNA units were generating broad band noise below the 3.7 to 4.2 GHz range and this noise was degrading the picture quality in receivers with 'wide open' front ends. Working in concert with Royden Freeland at International Crystal (ICM) the **Purifier** product came on the market this fall to cure **that** problem.

Nor has his globe hopping travels entirely stopped. This past October he packed up a Howard designed receiver, an LNA and some modest test equipment and hopped a plane for Perth, Australia. Way back at SPTS Miami last February Howard had met an Australian who wanted to be the first to offer low cost terminals in the South Pacific. This past September the Australian government run ABC (Australian Broadcasting Corporation) had inaugerated a test or trial service through a Pacific Intelsat bird. Using a half-transponder format (two video plus audio signals squeezed into a single 40 MHz wide satellite channel) and a spot beam in the 30/31 dBw region, the Australian government was interested in finding out if the present 4 GHz birds now available in the Pacific could provide an 'interim' DBS service for remote areas of Australia.

His Australian cohorts had only managed modest success prior to his arrival. A 12 foot parabolic produced pictures of a sort in Perth but nothing that could be used or enjoyed by non-technical people. Within a week of arrival Taylor had a 16 foot Spherical antenna assembled and operating. Engineers employed by the Australian government shook their heads in wonderment (down in Australia they call Tay "The Crazy Professor") as noisefree pictures came out of the system. They had never seen a Spherical antenna before (especially one fashioned in a metal working shop where cattle feed tanks were manufactured!) and the tiny receiver Tay carried around in his brief case was more than they could accept. When a group of these engineers asked Tay's permission to try out an $8,000 price range Japanese TVRO receiver on the Spherical antenna they had a further surprise; the pictures on the expensive receiver were terrible!

Only weeks after Tay's demonstration in Australia a company he and four Australians had formed would make its first installation at a small mining camp in the Australian outback and 100 miners and their family members would be plugged into the real-time world of television for the first time.

Many of you know of Taylor Howard because his name appears in print here in **CSD** or you see him at SPTS/SBOC events. Few of you know of the depth and dedication to this industry of this man who in reality has done more to get us where we are than anyone else in this field. The STT **'Howard Terminal Manual'** was our first manual and thousands have been distributed. From the basic receiving system designs found in that manual one can trace the foundation of an entire industry. Most of the commercial receivers now available in this field have some or a great deal of Tay Howard design work buried in their circuit boards.

What will 1981 bring for Professor Taylor Howard?

New projects are scattered over his California mountain home work bench. His part of a major revision of the 'Howard Terminal Manual' is completed and during the first quarter of 1981 STT will release a totally updated version of this basic, best-selling manual. But his best efforts will be directed at the battles ahead for S.P.A.C.E. and the industry since Taylor wisely recognizes that unless the legal foundation for this industry is firmly established in the new session of Congress all of the work done by he and others to date will come to a

sudden and dramatic halt. Mindful of the strides made to date and the opportunities ahead Taylor summarizes the industry's position in the year ahead as follows:

"The potential of low-cost satellite television and communication delivery systems really boils down to social and economic impact on established services. Television, like any piece of machinery, is a tool. We all have an obligation to see that this tool is used wisely and unselfishly for the betterment of all mankind. It is an awesome challenge. The pathway to a mature technology will be littered with the skeletons of poor planning, mis-managed resources, premature announcements and outright chicanery. Successful implementation of this new technology will require bold resolve and I believe no less than a decade of hard, intensive work. We have barely begun this journey."

H. Taylor Howard. The Low-Cost Terminal Industry's Man of the Year.

WEST INDIES VIDEO [Part III]

NO PROBLEM RE-VISITED

When we established a TV operating schedule for West Indies Video to serve the folks in the Turks and Caicos Islands we tried to foresee every potential disaster in advance and to have a contingency plan for virtually anything that might happen. We are human and we overlooked some possibilities along the way.

Here was the plan. Using the temporary 11 foot ADM antenna mounted on two heavy sheets of plywood atop the sand outside our rental house we plugged into live news and sports from the states. We married this to some videotaped movies and sitcoms to create a four hour per day schedule that began at 6 PM daily. Although WIV-TV was to be a scrambled (subscription) service we planned to run the 4 hours daily (plus a few more hours with sports on weekends) with no scrambling and no fee **until** January 1st.

During December, shortly after we returned from SBOC Houston, we planned to install a transmitter site atop Blue Mountain (the highest point on the island) where our channel 7 input and channel 4 output 10 watt translator transmitter would be housed. Ownership of the hilltop site is in some dispute. Everyone agrees that the island government owns a small chunk directly on top. It may be a circle 20 feet across or it might be as much as 30 feet across. The actual highest point is in the center of that circle. The land surrounding the small circle, over most of the rest of Blue Mountain, is owned by a stateside pioneer who came here as one of the first ex-patriot settlers. He has a price tag on the four lots that make up the top of the hill and on down the sides; $100,000 per lot.

We initially asked the government for permission to use **their** circle of property and they granted us that permission. We figured a small ten by ten building would house everything we wanted there and a short 20 to 30 foot self supporting tower would hold the TV antennas, a two-way radio repeater antenna set and eventually the FM broadcast transmitter antenna system.

The owner of the property all around decided we were attempting an end run on him and he let it be known that the roads into the area were privately owned (by him) and he could (or would) block entry. I saw a court battle coming and chewed on the problem for awhile. The government said **they** would condemn the roads and take them over but I didn't want them in court either over the 'problem'. So I went to see the property owner and asked him if we couldn't work something out.

He allowed as how he really didn't want any type of **building** up there. It felt it would spoil the attractiveness of the lots he hoped to sell one day. I agreed with him only after offering to make the building look like anything he wished, including a giant mushroom. After doing some more figuring I decided that what we **really** had to have up there was perhaps 23 feet of tower (this is no carelessly arrived at number I assure you!) and since the electronic gear was going to run off of 12 volts (with solar powering charging a battery) we could actually hang some small outdoor metal boxes on the base of the tower inside of which the TV translator transmitter, the FM translator transmitter and even the VHF repeater station could be stuffed. That satisfied the property owner and so we avoided a court confrontation on that issue.

The system was to be installed on the hill early in December. At **the same time** we were to start moving equipment from our temporary rental property to the Annex building on Grace Bay which we had planned to move into around the middle of December. The local power company had promised me they would have AC power (such as it is) to the Grace Bay location by December first. When the Coopers returned from Houston, via Miami, late in November there was no power even close to Grace Bay. Furthermore, it didn't look like we would get it even during December.

Now **this** was starting to be a problem. Yes, we could **probably get by** with gas driven protable power generators in a pinch but after trying to slave all of our tape decks and other TV broadcasting gear to the island's diesel generated powering system for three months I knew we would be biting off more than we could chew to crank up a 5 or 7.5 kW generator at Grace Bay and attempt to run on a **daily basis** from it.

So I decided some pressure had to be brought on the power company. When we signed off the air November 30th we ran a roll on the screen which took seven pages of character generator memory to complete. In essence it said that there would be **no more TV** until we had power on Grace Bay and we listed the power company manager and his phone number to contact for more information as to when TV would come back on.

Early the next morning my telephone rang. It was the power company manager and he was very angry. He had received several telephone calls from people wanting to know when TV would be back and although he had not seen it himself he felt we were really in trouble for blaming him for the lack of electricity. After yelling at me for several minutes he hung up the phone. Without even saying good bye.

A couple of hours later I dropped into his office. **He was not glad to see me** and promptly handed me a letter. It said that I was not going to get power. **Ever**. All sorts of retaliation flashed through my mind including a great TV special that would dig deeply into the sorry condition of the local power company. I knew dozens of people who had asked for power connections years ago. I knew a hotel running on a diesel generator because the hotel owner had a fight with the power mogul. I knew Mike Wallace's unlisted telephone number at CBS and I thought I could write a great Sixty Minutes piece on island living.

Alas, as much 'fun' as all of this might be, the end result would be bitterness and confrontation. It wouldn't get decent TV operating any sooner. Some other path had to be found. I agreed to modify the language of the roll announcement (I planned to run it daily until electric power was in - in place of TV programming) softening (but not eliminating) the blame for the lack of TV on the power company and to continue running at least the 7 PM live network satellite news. **If** he would get busy getting me electricity. That night I did as I said I would and to his credit the next day he had a crew out there installing cross arms on poles. It took them nearly ten days to get power to Grace Bay and the Annex but we did get it.

In addition to the lack-of-power problem awaiting our

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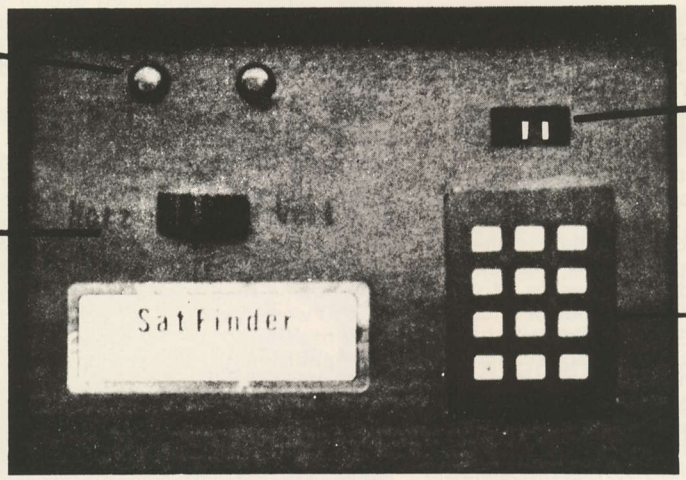

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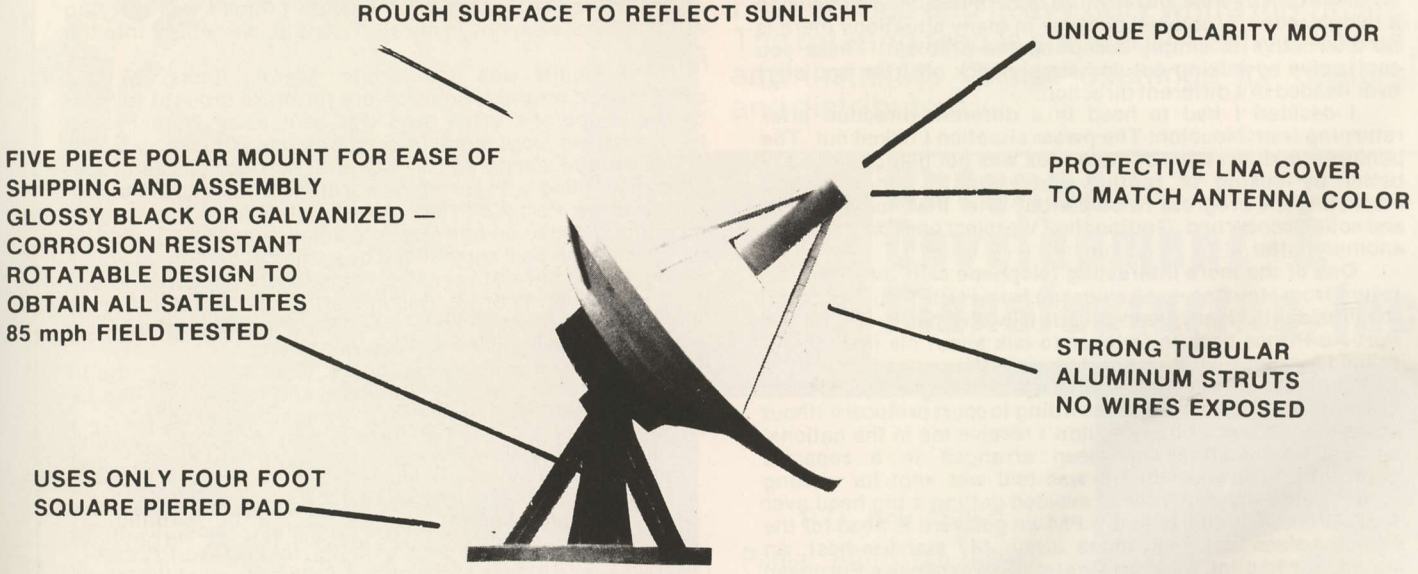


STREAMLINE PACKAGE — NO GEARS, BULKY MOTORS, CHAINS, ETC.

PATENT PENDIN

return from Houston we also found the Annex construction project had lost ground steadily in our absence. Rather than getting into the Annex in mid-December we were going to be lucky to get into it by mid-January. This was another crucial timing problem since the people we rent from were to be down to live in their place themselves starting January 20th. We were going to be close.

Additionally, I had left my partner running the 4 hour per day TV station in my absence. Depending upon your point of view that either didn't go well at all or it went too good. He fell in love with the satellite feeds on WESTAR I and decided to expand the TV day from four hours to as long as there were signals on the bird. He jumped in and out of programs with the arms of an elastic man, fell asleep late at night leaving the satellite feeds plugged in long after regular programs stopped and many island residents learned new words when network crews were setting up equipment.

Months prior I had laid out a full day to day schedule with specific movies and sitcoms and the like slated for each day through December 31st. The schedule was to have been followed in my absnece. It was not. Nor was a log kept of what **was** run, when, so naturally I had no way of knowing which programs could still be run without engaging in inadvertent repeats. In addition to this unhappy circumstance a list of projects necessary for the successful transition to the Grace Bay location and the Blue Mountain transmitter location were undone.

One of the facts of life you adjust to here is there is no big reservoir of talent. In the states, even in rural areas, the Yellow Pages list numerous suppliers of goods and services. If you can't get along with one, you at least have the option of finding another. The second may be no better than the first...but the option is there none the less. **We have a Yellow Page** section in the Turks & Caicos telephone book. It has 11 pages and I estimate 75% of the 11 pages are filled with block advertisements for the firms listed. Many companies are listed a dozen or more times under various headings because they operate as 'trading' firms importing goods required to keep life sane. Other than hotels and taxi services, very few listing categories contain more than a single listing per category. In other words, you don't have much choice and you often find that a company that is listed as selling plumbing supply parts stopped handling them months or even years ago. New telephone books are not printed annually since the turn over is relatively small.

So it is a small 'community' spread over a half dozen inhabited islands themselves spread over an area perhaps 80-miles east by west and 40 miles north by south. You develop a tolerance for 'problems' because in many situations there is no alternative to simply accepting the problem. Those you can't solve by talking out you simply back off from and start over headed in a different direction.

I decided I had to head in a different direction after returning from Houston. The pwoer situation I talked out. The behind-schedule status of the Annex was not going to get any better by talking or ranting and raving. I stood around inspecting the progress twice per day after that, looking grim and acting concerned. Getting the TV project back on track was another matter.

One of the more interesting telephone calls awaiting our return from Houston was a message from Haiti. You may recall the President of Haiti, Jean-Claude Duvalier had brought us to Port-Au-Prince back in October to talk about his installing a private terminal. That was quite a visit. We arrived around 10 AM and were scheduled for an 11 AM meeting. I was dressed in my usual casual style and according to court protocal without being in formal attire they couldn't receive me in the national palance. A meeting had been arranged in a separate government palace which I was told was kept for visiting dignitaries. I was amused but avoided getting a big head over the inference. Finally around 1 PM we got word to head for the second palace some ten miles away. My stand-in-host, an accomplished pilot, managed to streak his expensive European car down side streets barely big enough for push carts leaning on the horn constantly as he negotiated sharp turns and streets filled wall to wall with some of the most impoverished people I had ever seen in my life. I glanced back ever now and again to see how many were squashed on a wall. Miraculously nobody got killed but several times I spotted Haitians sliding down walls where they had flung themselves flat as a pancake to escape our hurtling two tons of European steel.

The hilltop palace was anti-climatic. A small army of gardners kept the whole facility looking like a setting out of a James Bond movie. Two high government authorities met us. One is the director of communications for the nation and the second is the head of the national television service. Both had been called to the meeting on very short notice and both were obviously nervous about what the meeting might involve. I tried to smile a lot not sure where the alliances were. A few minutes later another European car pulled up. Out hopped four uniformed men each of whom carried in his right hand a piece of artillery about 18 inches long. ''Burp guns'' one of my hosts muttered. The four fanned out over the area, gave us a close visual inspection, and then one of them pulled a Motorola handi-talkie out of his belt and said something in French into it. Less than a minute later three more identical vehicles pulled up. Out of the first and third crawled eight more uniformed, armed, characters. Out of the middle vehicle came the driver who turned out to be President Duvalier and three more armed guards.

President Duvalier came my way. I was wearing my 35 mm camera over my shoulder and grasping a black thin line briefcase in my left hand. I had been warned that whatever I did I was not to make any 'sudden moves'. Don't reach into my pocket, don't fiddle with my camera, don't open my briefcase. As the President walked towards us I glanced at the guards surrounding him. I imagined that behind their sun glasses several were eyeing me closely. I did notice their burp guns were half raised as they walked towards us. I did the only intelligent thing; I stopped breathing and froze in my tracks smiling.

The President had a polite but not firm handshake. I had been practicing to myself my high school French for 'Hello, I am so pleased to meet you your highness' for several hours. In the clutch I as only able to say 'How do you do?' and he instantly smiled and answered in English 'Thank you for coming on such short notice'. I had also been warned that my camera and brief case would have to be left outside. Or at least inspected by the fellows with the burp guns. As we started inside I asked about my two carry items. After translation a guard reached for my items. Suddenly he pulled back and I glanced up to see why; holding both out at the end of my arms. The President was waving his own arm and hand motioning the guard away from my things. I glanced at President Duvalier and he smiled letting me know he didn't think I was carrying any bombs or weapons in my stuff. And so we retired into the palace.

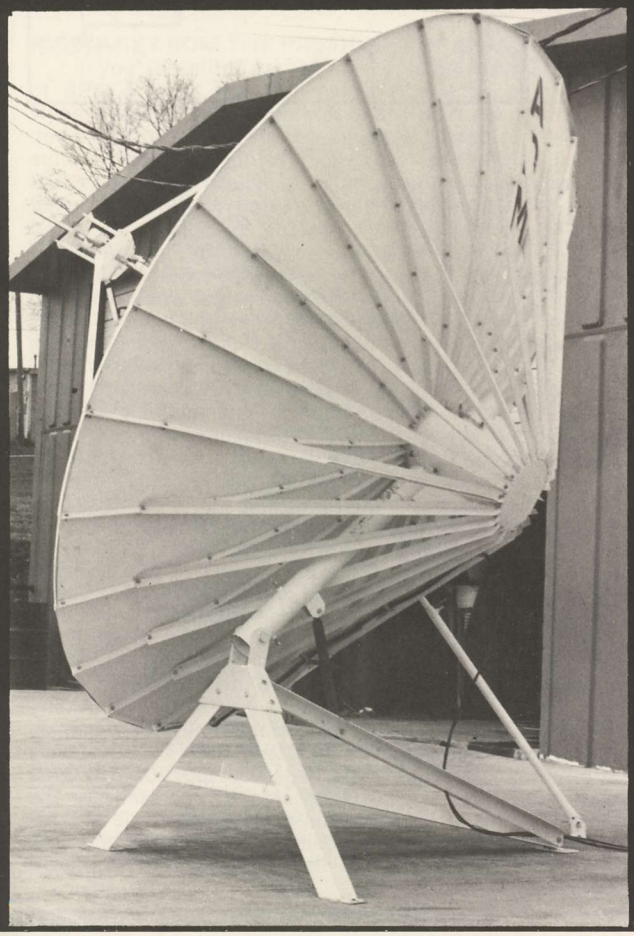
The facility was immaculate. Marble floors, 20 foot ceilings, and original Napoleon era furniture brought to Haiti by the Emperor's sister who was sent away from France because of her loose moral fiber. It was also virtually vacated of people. We wandered corridor after corridor passing room after room filled with furniture worth more than whole blocks of downtown Port-Au-Prince. We finally stopped in an ante room that opened on one side into a ballroom and on another towards a huge pool surrounded by a tropical garden. Six of us sat down and several servants immediately appeared to see what we wanted to drink. Remembering that you don't drink water in Haiti I settled for a coke. The President asked for a beer and then several in his group went along.

We talked for nearly two hours. They in French, me in English. The pilot was my translator and he did this like he drove; fast and well. The bottom line was simple enough.

1)Could I provide (or arrange for) a private satellite terminal for the President at both his 'ranch' and 'palace'?

2)Would I be interested in establishing an English language subscription television station, hopefully to be fed by US satellite programming, for Port-Au-Prince?

One fellow who directs and plans and oversees all of the island nation's communications was not friendly to me at first. He knew about satellite terminals (they have an Intelsat Grade B terminal) and he also **knew** that you didn't get television pictures for less than $250,000. I spent thirty minutes



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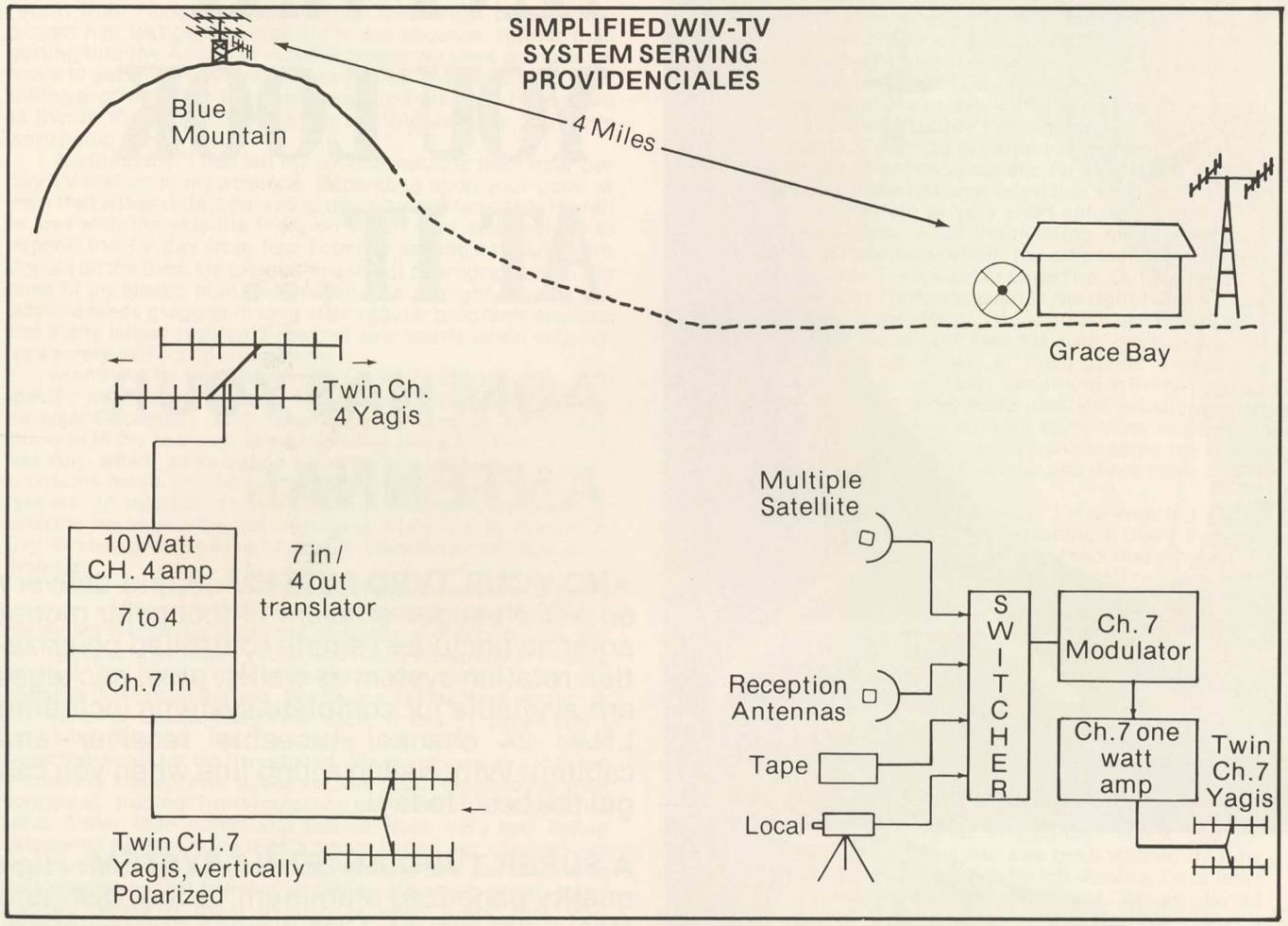

convincing him otherwise. I brought with me the STT 'Satellite Story' tape to do a little show and tell. I brought it on VHS because I had been told that everything in Port-Au-Prince was VHS. I was also told the President had an extensive collection of videotape gear and he could handle any format. He did but he didn't have VHS in NSTC. Only in PAL. The director of the national TV network sent a crew after an NTSC VHS machine at the studio and when they came back they had a BETA NTSC machine. He sent them back again and this time they came back with a U-Matic NTSC machine. I suggested they forget it. Funny thing...when the director of communications and I discovered we were both 'Hams' the wall between us disappeared. Pretty soon he was agreeing with me that you could have quality TV for less than $250,000 per terminal.

Putting an over the air subscription service (''We would like one just like you are installing in the Caicos Islands'' they kept saying) on for Port-Au-Prince was another matter. I was assured that there was a market there (a local cable service bringing in French and other European TV on tape has over 10,000 subscribers) and that we would have the full 'cooperation' of the national TV system including use of their 6,000 foot high mountain top transmitter site. I always wanted to operate a TV transmitter from a location over a mile high!

Still, there was the recollection of the car ride through the back streets of Port-Au-Prince and not too distant history of dictatorial rule. Jean-Claude Duvalier had inherited his post from his father; Poppa Doc. The elder Duvalier was certainly an authoritative chap who did things his way or no way. The younger Duvalier is only in his mid-20s and I suspect more than a trifle 'nervous' about where he is and what he is doing. **I know I would be** if I spent my day riding around in a military column flanked by a dozen guys with burp guns. So I said I'd study the proposal.

The telephone call from Port-Au-Prince, awaiting me on return from Houston, was from the pilot. The President had decided it might 'look bad' if he got a sixty channel television system while his countrymen were stuck with one channel of national TV service. A private terminal for President Duvalier would wait until phase two of the project got underway; the subscription TV service. I was frankly relieved. I had explained from the beginning that **I** do not dabble in selling or installing terminals. That should the President decide he really wanted one of these things I would see that he was put in contact with a qualified, reputable turn key installer. I had visions of getting calls or worse yet visits at 11 PM at night from a man 200 miles south of me demanding to know why his antenna would no longer rotate or why transponder 24 had gotten snowy. I reasoned that **he** probably wouldn't call me himself; one of those guys with the burp guns would. I was suggesting a six meter antenna, 85 degree LNAs with ortho coupler and a pair of receivers; one Washburn and one AVCOM. The antenna would track from horizon to horizon and this all kind of boiled down to Jim Vines from Paraframe and Bob Behar from A-B Electronics doing the installation. For me I was going to be content with a front cover shot on **CSD** depicting Vines and Behar instructing President Duvalier on the finer points of his home terminal.

It continues to amaze me how emotional people can be over television. Throughout the caribbean I see shanty-shacks with a total material cost of perhaps $50 topped with $100 television antennas. Haitian television is operated by the government and is largely devoted to news coverage of what the government is doing. Television from the Dominican Republic, the eastern half of the island of Hispanola, is

somewhat better because it does include **some** entertainment programming. The big $100 antennas one sees on Haitian shanty-shacks are invariably directed at the nearest transmitter in the Dominican Republic.

When we shut down our four hour broadcast day for a couple of weeks here on Provo to settle the power squabble we heard from hundreds of residents who had gotten totally 'hooked' on having access to the news, sports and entertainment of the outside world. Providing television to a new area carries with it a responsibility that can only be described as awesome. I sincerely hope that others who are working with the satellite system are aware of what it is they are doing when they install systems for people who have previously been without television service. It is a powerful, powerful medium and tool. And it deserves to be treated with great reverence.

S.P.A.C.E. REPORT

MESSAGE FROM THE PRESIDENT OF SPACE

If you're smiling at the title - Message From The President of SPACE - so am I, because it sounds so pretentious. Nevertheless, I hope you will share with me the humor and delight experienced when walking the halls of Congress this summer with our counsel, Rick Brown. We would stop now and then and Rick would introduce me to a Congressman or committee staff saying, "I would like to introduce you to the President of SPACE, Taylor Howard." Now, Rick did not whisper this introduction and nearly every time people would turn their heads to get a glimpse of the President of SPACE. I felt like a visiting dignatory. But I expected some of those who turned around were disappointed not to see Darth Vader. I've discussed that visit to Washington in the October edition of **Coop's Satellite Digest**, but would like to repeat excerpts of it here for those of you who may not have read it. Before doing so I am happy to report the tremendous success of our efforts in Washington. No legislation has passed either house of Congress that would be harmful to the interests of SPACE members. A detailed report from our Washington counsel appears later in this CSD.

During what was a critical period of time for us we received help from many people. We all owe a special thanks to Director Ralph Payne of Hubbard-Payne Communications, Inc. and member Wooly Rivers with Global Communications Systems. Both provided tremendous assistance and were more than willing to help on every occasion they were needed.

SPACE is particularly gratified that many members of Congress took the time to meet with us and understand the issues we presented. This fall, SPACE general counsel, Richard Brown, took me through the halls of Congress and arranged meetings with a number of people who have been central in formulating new laws governing telecommunications in this country. There are several things our readers should know about the people involved. First, Rick Brown is sure footed, trusted, and very highly regarded in the Congress and in all of the agencies which we visited. He has a keen

perception of both the large and small problems. His opinions are highly valued. Second, my experience in Washington has been very positive and has given me an understanding of how the system works. Finally, the people we met are desperately trying to solve a broad set of communications problems, want to do the right thing, and need our help.

One of our problems is that we are perceived as pirates and worse! We have been thrown into the same bucket as the non-franchised MDS receiver and STV decoder producers and owners. Sad to say, the differences and the true nature of the problem cannot be explained to a congressional staff or committee in a few minutes of testimony - it takes time and a lot of ground work. Explaining the satellite-to-earth problem alone takes time but to unravel it from the MDS-STV mess and the emotionally charged atmosphere surrounding them is nearly impossible.

We, SPACE, mainly Rick Brown, interacted with Congress in a helpfulway during the last several months. Very broad pending legislation was amended to solve the MDS-STV problem in a way which would also have the effect of making criminals out of earth station manufacturers, dealers and owners! Once the problem was explained, the amendment was softened to eliminate earth station manufacturers from consideration but we were unsuccessful in getting affirmative rights which would guarantee satellite access. Nevertheless, all legislation on this matter has been stopped for this session.

So what is the real problem? The real problem is that people who are, for example, receiving MDS signals with antennas bought from suppliers are not paying monthly access or copyright fees and are therefore regarded as thieves. Not just thieves in the eyes of the Motion Picture Association or Home Box Office to mention only two, but in the eyes of all three branches of our Federal Government!

It is now generally thought in Washington that what is needed is a ''theft of service'' bill making it illegal to decode, unscramble or otherwise recover transmissions which are intended to be available only for paying subscribers. SPACE has had some success in getting across the point that there are many homes to which acceptable signals are not available, that only the satellite can make them available and that, therefore, citizens must be guaranteed access to satellite signals - not free access, but access, and at the going rate. The government is well aware that certain segments of the population could become ''second class' or underinformed citizens if access is denied. All agencies have made very affirmative statements about the right to receive, the rights to manufacture, the free market system, etc. They are also well aware that if the free enterprise involved in producing information and entertainment is sabotaged by not being rewarded the, ''innovative systems such as STV, MDS, and satellites will disappear and we will forever be left with the three networks.''

So what is SPACE going to do and what is its stand? First, we intend to provide the technical and educational input to anyone in the government who will listen - they are anxious to learn! Second, we intend to represent the views and desires of our membership to the same people. Our main goal is to establish the right to receive satellite signals for anyone buying an earth station, a right predicated upon paying for the service. Since we are now an important consideration (though still a relatively small market when compared to the present 17,000,000 cable subscribers) in communications planning, it is time to open discussions with the major suppliers to not only guarantee access, but to do it in a way that generates revenue and puts the legal question to bed once and for all.

It is clear to Rick Brown and to me that there will be legislation that affects the entire industry next year. If this year's legislation had gone through it would have killed or seriously wounded the private terminal business. SPACE has made itself known but now needs help.

We need individual members both for strength in numbers and for their ability to do an educational and lobbying job on their legislators and local news media. We need corporate members for the above and for the financial support they can give.

You, as an individual or a company, need SPACE so that you are well informed, so that you can best use your limited time most effectively and so that you can stay in business and/or out of prison.

Though our case and intent are clear and honest, the threat of disastrous legislation is very real. I feel that SPACE can not only make our viewpoint known, but that we can make it prevail and be a positive force in the development of the world's first and finest free enterprise telecommunications system. **[Taylor Howard]**

MESSAGE FROM COUNSEL

As most of you know, on July 2, 1980 Congressman Richardson Preyer introduced HR 7747, which if enacted would have been disastrous for manufacturers, distributors and users of private earth terminals. Despite several attempts to move this legislation, it has not reached the floor of the House. Furthermore, Congressman Preyer has not been re-elected. But, this does not mean that legislation on this issue has died.

As you recall, the proponents of the Preyer Bill were MDS and STV operators, motion pictures suppliers and pay-TV programmers. In its original form HR 7747 would have imposed substantial civil and criminal penalties (from $100 to $1,000,000 and prison terms) for unauthorized interception (and aid of interception, e.g., by manufacturers) of subscription programs. This legislation would have applied to manufacturers, distributors and users of earth stations.

Among the problems SPACE perceived with the legislation is that there are many services on the satellite that are not subscription programs. But a manufacturer or distributor or user could be caught up in civil or criminal lawsuits, searches and seizures, depositions and interrogatories, and the like, because no adequate safeguards for legitimate use of earth stations were provided in the Bill. Furthermore, SPACE believed that a right of access to satellite television programming distributed via cable TV and other means ought also to be made available for private earth station users (both commercial and non-commercial).

As previously reported, three weeks after introducing HR 7747, Congressman Preyer simply offered the whole bill as an amendment to HR 6121, the bill restructuring ATT and the common carrier industry. SPACE was successful in having Congressman Preyer provide an exemption for the manufacture and sale of earth stations. We also proposed an exemption on the user side but that was not acceptable. In any event, HR 6121 was reported out of the full Commerce Committee and referred to the Judiciary Committee from which it was reported out in a manner spelling a kiss of death for the bill in this session.

However, before HR 6121 was reported out of judiciary, Congressman Preyer, aware that HR 6121 had a rocky road ahead, tried to steer a gentler course for his HR 7747. So he offered it again, as an amendment to yet another bill, HR 6228, dealing with media cross ownership. Because it appeared that the cross ownership bill might very well get to the floor of the House, SPACE had to strenuously oppose Congressman Preyer's attempt to amend HR 6228. While it would not be a good idea to reveal all our strategies in this rather public newsletter, some overall view of our approach should be informative.

We worked with the FCC, the Commerce Department, the majority and minority counsels to the Committee and with Congressman Preyer's staff to try to reach a viable compromise. While our original position was that HBO and other program providers had to encode their signal to achieve protection, we bent considerably from this position in order to obtain a reasonable solution. Our bottom line was that private earth station users, as a matter of national telecommuniations policy, should have a right of access to all satellite entertainment and educational programming provided to CATV systems and other such distributors. Further, where a subscription charge was made for such programs, e.g., HBO, the private user had to pay at the wholesale rate -- whatever, e.g., HBO charged its other customers.

We believed this was a reasonable compromise. Users would pay for programs ''meant'' by the supplier to be paid for even though no copyright protection would be available, in our view, against the home user. In other words, we did not want a free ride. And we supported stiff penalties for those who

violated the law.

Well, it may be hard to believe, but HBO and the Motion Picture Association of America fiercely opposed our position. Our job was to line up enough support on the Commerce Committee to either defeat the Preyer Amendment or to "amend" the Preyer Amendment to reflect the position just described. Not only did we obtain a sponsor on the Committee for our position, but we believe we also lined up enough support to get our amendments passed.

At the last moment, Congressman Preyer decided not to pursue his amendment because it was "too controversial". Thus ended what was an extremely hectic couple of weeks on Capitol Hill.

The battle is by no means over because providers of subscription programs generally believe that protection is needed against theft of service. So there can be no doubt that these interests will once again seek legislation.

SPACE's position has been not to oppose reasonable theft of service legislation. We believe that the position taken on the Preyer legislation was reasonable and will pursue that position in the next Congress.

OTHER NOTES OF INTEREST FROM WASHINGTON

Several members of SPACE have received letters from HBO stating, in essence, that it is illegal to sell earth stations to private users because such sales aid in violation of Copyright and Communications Act Laws. No suits have been brought. We wonder out loud to what anti-competitive extremes HBO will go. We know that HBO's parent corporation also owns the second largest cable company in the country and that HBO's refusals to deal with apartment house, condominium and backyard users of earth stations certainly benefits that cable subsidiary and other cable customers of HBO by insulating them from competition. HBO's refusal to deal limits the market to cable, MDS and STV. We have been compiling records on refusals to deal by HBO and Showtime. Please let us know, in writing, of your experiences. We wonder how HBO can make as big a fuss as it does about the withholding of movies by Premier's suppliers for a nine month period when HBO totally denies its product to our market.

PROGRAMMING CORRESPONDENCE

SPACECOAST AGAIN

As a matter of interest to you, if you don't already know it, Spacecoast Research says some pretty harsh things about you in their catalog. After paying $7.95 plus postage and COD charges I wondered how they could say anything bad about someone else after 'ripping off' someone like me for this amount of money for such a measly amount of information. In their literature about the only the thing the writer said was how great their products were at Spacecoast. Plus, their prices are on the steep side. If Coop does not have their catalog maybe you should pay the price to see what these 'birds' are saying about you. I learned a long time ago not to pay attention to such garbage but I cannot help but wonder how someone else would

take such criticism.

W. O. Moore
Smyrna, GA 30080

It was just about a year ago that Spacecoast flooded the 'market' with literature promoting a $1600 price range combination LNA and receiver. CSD **checked into their product and found it did** not **exist; even in proto-type form. We reported this in print fearful that people might be sending them money for a product they said was ready to ship out. As regular readers know we have our share of 'rip-off' artists in this business and then we have those who linger on the edge of illegal activities not quite sure which way to jump. We believe the following letter to Coop, dated last June 24, from** former **Spacecoast partner [and 50% owner] Steve Reed says it all about the present Spacecoast operator. Present Spacecoast literature attacks the industry's man of the year Tay Howard in an uncalled for tirade. We don't know Bruton but in reading his literature we have to agree with Steve Reed who characterizes him as 'generally paranoid'.**

"...I left Spacecoast Research in early February because I simply did not agree with the business methods and plans of my partner, Dave Bruton. He also insisted on absolute control of the business. He read all correspondence, monitored all phone calls, dictated letters that I was to sign, determined my salary, regulated strictly my limited free time, wrote all ad copy, and in every way prevented me from deviating from his plans for Spacecoast Research. He went so far as to order me to change my signature because he felt it was easy to forge. This was after I dared remark that his signature was difficult to read. He dislikes you and does not hesitate to disparage STT or its products in his book, The Earth Station Information Manual...Dave so enjoys confrontations, especially physical ones. I was on the receiving end of much of his abuse and although my friends would like to see Dave get what is coming to him, I feel (...that anyone confronting him...) would get the worst of it, unless they were armed and very careful. Dave is big and likes to use his fists, however most people do not expect his devious nature and blazing speed. He is generally paranoid about the outside world and feels that everyone is out to get him - so why not get them first (!)."

Reed continues to live in fear of Bruton. If anything should happen to Reed we won't hesitate to turn over to 'the authorities' a collection of material we have filed away regarding his former association with Bruton. (And here you thought 'action' only happened on the tube!).

UNHAPPY PERSON [Needs Help]

I purchased a copy of Steve Gibson's manual (The Satellite Navigator) at the San Jose seminar. I planned to build a motorized mount and be receiving satellite TV by late fall. I was wrong! I have spent over $500 to date trying to follow Mr. Gibson's manual. I have a stack of surplus parts but no functional antenna mount. Mr. Gibson wrote his manual vague enough so he has no responsibility for its content and use. Since becoming interested in satellite TV I have spent close to $1000 (parts plus seminar expenses) and I am no closer to satellite reception than I was 12 months ago. I feel certain I will never have a TVRO station thanks to the sour taste left from dealing with slick promotions like yourself and others in the TVRO business.

Dennis Trusty
25738 Silverhorn Lane
Evergreen, CO 80439

Gibson's manual is anything but vague! It appears you may have gotten the carf before the horse here worrying about a motorized mount before you got a working antenna, receiver and LNA. Gibson treats all **types of mounts including the very simple 'laundry pole' system which will get you up and running with a minimum of expense and experience. From there he provides layouts for more complex mounts including surplus-hardware motorized systems. Some people are simply** not mechanically adept **and as we caution in our STT brochure** "do not tackle a project you feel uncomfortable with...". **Knowing your own limitations is an important part of coping with any situation.**

SUPER FEED ANALYSIS

Those who have acquired a Chaparral Super-Feed will notice the Allen-Head set screw securing the decoupling sleeve to the feed tube. Experimenters will probably try various settings (out of curiosity) to see if it effects performance of their systems. For those who would do so it would be wise to note the optimum protrusion distance the feed sticks out in front of the decoupling sleeve. This distance was found to be .6 inch as determined by analysis of radiation patterns measured in an anechoic chamber under carefully controlled conditions. The effects of varying the protrusion distance can be generally summarized as follows:

1)Too little protrusion will result in a more sharply 'peaked' pattern in both the E and H planes.

2)Too much protrusion will result in grossly unequal E and H plane beamwidths.

In either case the aperture efficiency of the reflector will suffer and you will not be getting maximum signal at the input to your LNA. The optimum distance of 0.6 inches will result in the pattern having nearly equal E and H plane patterns and this is where the overall pattern mostly closely approaches an ideal rectangular illumination characteristic. Which is another way of saying that in this position there will be uniform illumination across the reflector surface with no spillover at the edges. For anyone who would like copies of the measured characteristics of the Super-Feed a complete set is available for a $5 money order and a stamped, self-addressed envelope.

Jack Trollman
3448 Churin Dr.
Mountain View, CA 94040

We checked three Chaparral feeds we have here and found all to be precisely .6 inch protrusion as provided by the factory. Leave the Allen Head screw alone - you can't make the system perform any better by messing with it, you can only make it worse.

JERRY LEWIS TELETHON

I have been a subscriber to **CSD** since the first issue and I must compliment you on the substance of the articles - both technical and programming. It is most interesting and informative.

One of my clients is the Jerry Lewis Labor Day telethon network for which I am responsible as Director of Telethon Network Facilities. I noted with interest a picture on page 10 of the November issue with three Turks and Caicos Islanders watching the event live via satellite. I had arranged for twin satellite feeds; one on WESTAR I for the continental 48 states and another on SATCOM FI to reach Hawaii and Alaska. I would appreciate any comments, technical or otherwise, you might be able to supply on this year's telecast. My client, the Muscular Dystrophy Association, would be most interested.

Roylance H. Sharp
Vanda Communications, Inc.
Florham Park, N.J. 07932

First of all this was the initial exposure here to genuine entertainment television; earlier feeds caught with the then-new terminal were largely PBS or news or sports. Of the people (and there were many) **who drifted by during the Telethon to get a look at real, live TV, virtually none had ever seen Frank Sinatra or Jerry Lewis or whomever before. They were familiar with their work because of radio but had no concept what these entertainers looked like. We were not broadcasting at that point so had no way to re-distribute the Telethon to the island. However we are hopeful that** (perhaps through you) **we can** 'officially' **be a part of the network in 1981 and look forward to carrying the full telethon to not only Providenciales but the islands around us as.well.**

A COMPLETE KIT?

I have enjoyed **CSD** for the past year; I find it very interesting and look forward to each issue. My complaint is that through no fault of yours I do not have a technical mind. Some of the information I understand, some I do not. Can you

imagine how many more there are like me than those who are blessed with technical minds? I have also noticed during the past year what it costs to purchase a complete unit and what it costs to do it yourself. The difference remains quite substantial. May I suggest a complete kit? May I also suggest that you devote a complete issue of **CSD** to some plain ole' country boy talk of what you need and where to get it? Thousands of people are like myself; ready, and willing to spend money to create the communication system of tomorrow.

Ken Sutherland
Calhoun, GA 30701

A year ago it looked like everything would be available in kit form. Now it looks like very little, except perhaps antennas, will stay that way. LNAs never were 'kit-able' and as Washburn and Ramsey learned receivers probably were not kit-able either.

BIRKILL COMMENTS

Regarding the October issue of **CSD** - the Rohner/Gillaspie NEC LNA system is directly from the NEC application note. The 218's are good (I managed to get a couple at last from CEL UK at around $100 each) but the Mitsubishi 1412s advertised in **CSD** for $75 are not available here in the UK at **any** price! I do like Rohner's biasing circuit but believe that a lumped-matching structure for the elements would work better, when optimized, than the microstrip. The problem for the amateur builder is optimizing of course. However even the best mircrostrip really needs 'tweeking' for individual (GaAs-FET) devices to give the best performance. The Rohner second conversion oscillator substitute looks like a good design as well. I made up a similar oscillator early in 1980 to do the first conversion job, using a cheaper transistor (the TRW plastic TP393). The problem at higher frequency is getting a high-enough 'Q' tuning diode close enough (in terms of wavelength) to the transistor to get the necessary tuning range.

Correspondent Jose-Trevino-Abrego is mistaken in his 'explanation' of the 'convergence sphere' of the spherical antenna. His sphere is an appoximation which holds only for rays from some way-off axis. At less than 20 degrees or so (off) the sphere has a larger radius and approximates more closely to Swan's straight line (for a long-focus spherical) which is the condition which provides usable focusing anyhow. And for absolute minimal spherical abberation the system would use **only a part** of the spherical surface **at one time.**

Steve Birkill
Grenoside, Sheffield
Great Britain

Steve Birkill, since visiting in North America in July, has been at work on a pair of new manuals for STT. One, about completed and possibly ready for the spring SPTS, will deal with the nitty-gritty world of receiving international satellite TV signals; something about which we all know too little. There is a possibility that Birkill may be leaving the UK for North America one day soon having determined that the microwave industry in the UK is not going anyplace important very fast and the opportunity of his lifetime is on this side of 'the pond'. **If that happens we anticipate having Steve joining us at future SPTS events to share with experimenters his very talented mind and experience.**

OUR NOVEMBER issue report (see page P16) that fight promoter Don King had **authorized** private terminal reception of bouts he promotes provided no fee is charged was not correct. King was commenting **only** on after-fact Ali-Holmes battle, not creating general policy for all of his future fights (such as Leonard/Duran late in November). Leonard/Duran fight **was scrambled** on both Westar **and** ANIK but was left unscrambled on COMSTAR D3 transponder 24 feed to Caribbean. Virtually nobody in US except southern Florida could use the D3 feed however.

BIRD OPERATIONAL NOTES

PANORAMA magazine for January carries report on satellite television packages for home use; much edited from original manuscript submitted by Coop. **ESQUIRE** working on article for early issue as well.

INTEREST in low power (and very low power) TV in Houston at SBOC '80 was of record setting proportions. SPACE attorney Rick Brown led discussion with Michael Couzens from FCC. Brown reports several dozen would-be operators have contacted his firm for assistance in preparing FCC filings.

FIRST out of the shoot to provide programming to LP and VLP stations will probably be new Prescott, Arizona station KUSK. Financed by Sears Allstate fund, company is called 'Neighborhood TV' and will use transponder 5 on WESTAR I for daily network feed service of western movies, rodeos, C and W music shows. Startup date is uncertain; 1982 is likely.

LATEST to announce scrambling technique is firm titled 'VVS Energy Patent Fund, Inc.' which proposes "variable velocity scanning" system encompassing solid state memory storage of transmitted pictures 'refreshing' the image only when and where changes occur in the video. System is actually slanted more at doubling or tripling up number of TV video signals that can be carried on single transponder rather than scrambling but if it works and catches on...and you don't have decoder. In this case price of decoder is reasonable (estimated at $80).

LIVE Japanese television will appear in first half of 1981 on transponder 22 during daytime feed of Modern Talking Pictures. Show will be actually composite of news originating in Tokyo and matched by commentary from New York.

$10,000 AWARD has been established by Telespazio, the Italian consortium that represents that country in INTELSAT. Award goes to outstanding student or independent research working in satellite communications arena. Several **CSD** contributer names pop into mind...

WINTER CES show in Las Vegas January 8-11 will include perhaps ten exhibits showing satellite TV system hardware to the estimated 50,000 electronics people expected to gather.

RCA proposing that SATCOM V be dedicated exclusively to Alaskan use (RCA Alascom currently utilizes up to 14 transponders on SATCOM F2). If approved bird will sit **west of** present FI location of 135 degress.

LATEST warning to broadcasters about threat of DBS suggests that broadcasters should prepare themselves for "most important regulatory question (facing) free TV in the 1980s...". One suggestion being circulated is that broadcasters develop plan to start 'educating public to the **dangers** of DBS service...". Similar efforts to warn public of **dangers** of cable TV helped put off cable growth in late 60's buying for broadcasters sufficient time to enter the cable business on their own.

GOLDEN WEST, operator of VEU network with nightly movie and special event feeds on WESTAR transponder 9 reportedly may have overestimated its ability to create national network with resources available. Company operates KAUT (channel 43) in Oklahoma City with outlets in Dallas and other mid-western cities. Company plans to inaugerate STV operations in Chicago and Atlanta have been put back, perhaps dropped. Fate of continued use of WESTAR I transponder 5 is **also** in doubt.

NBC program feeds appear headed for COMSTAR II and/or replacement COMSTAR which will sit aside COMSTAR I (128 degrees west). Network does not plan **direct** feeds to affiliates (yet) but will feed via COMSTAR programs for time zones with receiving stations to be dedicated at Chicago and Houston (with backups at Dallas and Denver). This will be a 24 hour per day service using satellite to leap frog from New York and/or Los Angeles into regional centers mentioned. From there the links will carry service on terrestrial microwave to affiliates. Start up date will be

sometime in summer of 1981.

ESPN plans college live hockey tournaments January 4th, February 2nd and 9th and March 26-28. The March games will be NCAA playoffs. In the basketball arena ESPN plans to provide time-delayed coverage of college basketball each Saturday from January 10th through February 28th. Live Tuesday evening basketball games from the Southwest Conference are scheduled January 10 through February 28th. Monday night will be 'triple header basketball night for ESPN starting January 5th and running through February 23rd. The first game each Monday will be from the Metro conference (live) followed by a Pac-10 game (live). Ending the triple header will be a Big-East game carried on a delayed basis.

NASTY MOVIES started WESTAR 3, transponder 5 (dial up 9 on 24 channel receiver) under "Private Screenings" network of Satori; December 6th. Service is repeated twice Friday/Saturday nights with 12 midnight to 3 AM for east and 3 AM to 6 AM west (all EST). Service described as "Sexploitation".

FCC decision made to allow 20 'new' satellites to be in service for domestic US service by 1986. Total number of transponders forecast for 1985 is 600 (there are presently 156 authorized for US, another 36 for Canada). Approval calls for 13 new C band (3.7-4.2 GHz) satellites, all either 24 channel or some number of C band and Ku band (12 GHz) transponders married on same bird. Line up over next four to five years looks like this:

70° - Southern Pacific Communications (SPC) with C and Ku band; **74°** - Hughes Communications with C band; **79°** -Western Union TDRSS C and Ku band; **83°** - RCA SATCOM C band; **87°** - ATT Telstar C band; **91°** - TDRSS number two; **95°**' - Comstar D1 and D2 co-sited temporarily, then Telstar C band; **99°** - WESTAR C band; 104, 109, 114 degrees - Canadian allocations; **123°** - WESTAR C bnad; **127°** - COMSTAR D4 C band; **131°** - RCA SATCOM (3R) C band; **135°** - Hughes C. band; **139°** - RCA SATCOM; **143°** - RCA SATCOM.

Significant problems for cable industry with RCA spots at 139 and 143 **too far west** for eastern USA and 83 **too far east** for Alaska and Hawaii. In effect, RCA will only have orbit spot at 131 capable of 'full cable TV service' **if** FCC can make it stick.

CABLE NEWS NETWORK got six month extension of service 'life' from FCC on present transponder 14, FI. There **had been** concern service would end December 31st.

ABC enters cable/satellite programming world April 5th with new 3 hour nightly service to be carried on transponder 11 of F1. Service will come on air **after** Nichelodeon signs off for night and repeat at 12 midnight eastern for west coast. Programs planned will be called 'Alpha Service' and will be in performing arts area.

ANIK B experimental 12 GHz service has been given new 18 month lease on life. Moves in Canada to turn ANIK-B into DBS type system at end of the latest extension period are promised. Many unhappy Canadians see time extension as simply another way to dodge issue of providing meaningful, multi-channel services to Canadian frontier area.

INTERESTING 28 minute report on emerging video technologies scheduled for January 28th at 12:15 PM eastern, WESTAR I, transponder 10 or 11 (where Blairsat normally runs commercials in AM periods).

3 METER antenna controversy started by NCTA warmed up at Western Cable TV Show in Anaheim in December. Study done by AFC/Microdyne for SSS indicated reduction of spacing from present 4 degrees between birds to 3 degrees will **not** result in interference with small dishes.

INTELSAT V-A, the first of a new breed of dual band (C and Ku) birds for the international satellite consortium is now being tested at 15 degrees east and after testing will provide two simultaneous TV channels plus up to 12,000 voice grade channels from location at 338 degrees east.

COLUMBIA may become first South American country with domestic satellite system. Hughes 24 transponder C band birds (pair) are likely late 1984. **Direct TV service** is part of plan and area covered would include much of Northern South America, Central America and western Caribbean.

ORDER for AP audio-only earth stations recently jumped from 400 units to 900 stations through California Microave supplier.

SERIOUSNESS of Australian government over satellite communication system appears buried in fine print of recent call for bids on planning documents. They are asking for 'skilled applicants in all levels of satellite communication systems to apply for engineering posts'. If interested contact Administration Director, OTC, Box 7000, GPO, Sydney, NSW Australia 2001.

SBS launch of SBS-I bird achieved successful transfer orbit. System expects to be operational before end of first quarter this year. Recent customer to sign for service was General Motors ordering three terminals capable of 1.5 megabit bandwidth data.

ANOTHER ATTEMPT to get Canadian cable TV systems into satellite business. Group of Canadian cable operators proposes to place childrens, business and other 'narrow-format' programming on ANIK-3 for per-home charge (to local cable firms taking service) of around ten cents per month. Canadian cable firms were given green light to use satellite feeds in spring of 1979 but only service authorized for them to use has been occasional feeds of House of Parliament coverage. Attempts to create and fund cable **programming service** for Canada in interim have failed to get government approval. This one may also fall on deaf ears.

NOTE: If you are moving and wish to have your (first class) copy of **CSD** follow you to your new address, **we must have** both your present address **and** your new address **PLUS** the addressing label from your last received copy. Address changes are normally processed in the following month's mailing group but **only when an address label** accompanies your request for a change.

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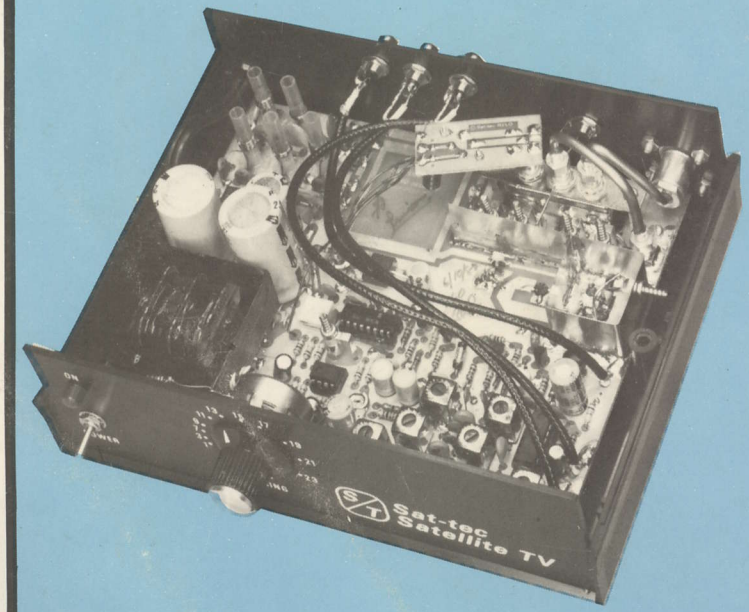

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